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The BUILDER

AN

ILLUSTRATED WEEKLY MAGAZINE

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR, SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

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"Every man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word TO BUILD is the Anglo-Saxon Býlðan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"Always be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE.

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The Late Dr. Schliemann.

THE sudden and unexpected death of Dr. Schliemann has been attended by almost universal regret. The story of his life had been widely known, with its early struggles against poverty, his subsequent success in business, and the ultimate devotion of his energies and fortune to the ambitious project of exploring the sites rendered famous by Homer, especially the sites of Troy, Mycenæ, and Tiryns. All these things he told in books, which were translated into several languages, the effect being that he soon became popular all over Europe and America. But, besides this, he was personally ubiquitous. He was known to many in many lands, not least in our own country. To these almost innumerable personal friends his death will have brought profound grief, but most of all, perhaps, to those who knew him in his home at Athens; and the number of these alone must be legion. No one will be missed like him in that city. He had a warm welcome for all who called on him. His hospitality was great, his enthusiasm was boundless, and his knowledge of practical and useful matters was unrivalled. In Athens he was a prominent figure,—possibly the most prominent. To the Greeks in general he was a benefactor of a kind which they had never seen before. At first a foreigner who settled among them, and never ceased in his endeavours to rouse them to the glories of their early history; and finally, a foreigner who had actually recovered enough of those glories to draw the eyes of all educated people to Greece. It will be strange if the Greeks do not preserve his memory in a worthy manner.

Born in 1822, Dr. Schliemann was still in the prime of life when he retired from business, and started as an explorer of the site of Troy. That was in 1868. For a while his excavations were unsuccessful, and no one was surprised. Some thought he was on the wrong track. All were ignorant of any qualifications that he possessed for the task. He was as yet unknown. By 1870 he had cleared away a good deal of soil at Hissarlik, the site which he had espoused as that of Troy. The results were meagre, but he was hopeful and buoyant. Time never was heavy on his hands. One rainy wintry evening in that year, when the passengers were arriving on board a steamer at Smyrna bound for Trieste, he was to be seen in the saloon seated busily reading the Koran. He had been learning Turkish and Arabic. During the voyage he talked all round, and with equal facility, to the very polyglot company on board. His special talk was, of course, of Troy. With restless energy he returned to Hissarlik, and by 1875 was able to lay before the learned world, in "Troy and its Remains," an extensive series of results on which he claimed to have proved that Hissarlik was the true site of Troy. The tide of opposition set in. He was told that Troy had never existed; that Homer had created it; and that, in any case, the things found at Hissarlik did not illustrate the Homeric poems—as, in fact, they do not to any appreciable degree. It would have been wiser of Schliemann to have maintained simply that he had found in the locality indicated in the "Iliad" the ruins of a pre-historic city which had been destroyed by fire, and that very probably it had been the fate of this particular city which long after had stirred the muse of Homer. His discovery would then have been examined in its true light, and its great importance for pre-historic study would have been amply recognised. But that was not his nature. Fired by a purely personal ambition, he required show and glitter. A poor piece of bronze must be Priam's chest. Something else must have belonged to Helen. Hideous earthenware vases, such as are found among most primitive people, must represent the owl-eyed Athena. Priam's chest must be Priam's chest till some one proves it to have been John Smith's. That was his line of argument in those days, and if he became wiser and more cautious in later times, as he most undoubtedly did, he had, nevertheless, provoked by these early outbursts of enthusiasm many misgivings as to the value of the work he was doing.

After a time he returned again to Hissarlik, and gave us, in 1880, the results of his renewed exploration in the fine work entitled "Ilios." Even then he was not satisfied that everything had been done for Troy. Only last year he was there, digging and projecting a new campaign, which his death will have interrupted, unless he has charged Dr. Dörpfeld to carry it on. Be that as it may, it seems clear that, from Dr. Schliemann's own point of view,—the glorification of Homer,—these prolonged excavations at Hissarlik have been a failure. But equally, from the point of view of pre-historic archæology, they have rendered immense service. If a fault is to be found, it would be that the glamour thrown by Dr. Schliemann over these primitive antiquities has attracted many students who would have been better

employed on the later and finer art of Greece, and who not unfrequently have been repelled altogether from prosecuting the study further. But the crowning achievement of Schliemann was the discovery of the tombs at Mycenæ in 1876-7. Travellers had long been accustomed to admire the great walls of the citadel of Mycenæ. The two lions sculptured in relief above the gateway—the city arms, so to speak—were familiar in books on Greek art. The fine vaulted tomb outside the citadel, variously known as the tomb of Agamemnon and the Treasury of Atreus, had been quoted on all hands. Yet no one appears to have dreamt that anything of consequence lay buried in the weed-grown heaps within the walls. It is to the imperishable renown of Schliemann that he saw otherwise. He himself must been amazed when the graves opened and discharged their quantities of precious objects. It seemed quite natural to him to announce to the world that the bones which he had found of some primitive chief were the bones of Agamemnon. Homer was again dragged into the scene; and again a contest arose. But that is all past. The argument now put forward is that the antiquities of Mycenæ belonged to a much earlier age than that of Homer,—that they represent a civilisation which had been swept away by the invasion of the Dorians from the north of Greece about the eleventh century B C. It was of that past age that Homer sang; but so much of the actual remains of that age had been destroyed by the rude Dorians that Homer could not find enough among them to give local colour to his poems. For that he had to draw upon his own times. He knew only of the walls of Tiryns, the wealth of Mycenæ, and some few other points. When the argument is put on this ground the discoveries at Mycenæ assume the first importance. They would thus teach us more of that early race than Homer himself knew. But this argument cannot be accepted without question. As likely as not these antiquities are the remains of the Dorian invaders. The Dorians were rude, but not ruder than most of the antiquities; and, in fact, analogies have often been observed between the mode of burial at Mycenæ and at Hallstadt in the Austrian Tyrol. More recently, with the discovery of two gold cups at Vaphio, near Sparta, in a tomb of the Mycenæ kind, we have seen that the men figured on these cups, in the act of hunting bulls, have much of the Celtic type. They are of a peculiar, slim form, with long hair. They wear boots with straps twisted round the leg, well up towards the knee, and they have a girdle round the waist. These are striking features of the ancient Celts, which it is very probable the Dorians had shared with them. So that after all the graves of Mycenæ may attest the presence of the invading Dorians and their settlement there.

When Dr. Schliemann had thus provided work for a generation of archæologists, he moved next to the neighbouring site of Tiryns, with its Cyclopean walls and its traditions of the heroic age. Here also fortune smiled on him, though she did not go so far as to indicate the whereabouts of the old prison-chamber of Danaë, with its shower of gold. Under the long-neglected heaps of earth he found the ruins of an extensive house or palace, which in its plan corresponds, as many believe, with Homer's references to the construction of palaces. Others, whose love for Homer is of a more poetic kind, resent this forcing of an archæological meaning out of his phrases scattered here and there. Some even deny that his expressions apply to the palace at Tiryns. At all events, the ruins which Schliemann found are there, and they clearly belong to the same period as the Mycenæ antiquities. The fragments of painting in stucco from the walls put this beyond doubt. In character they are identical with fragments found at Mycenæ since by the Greeks who have continued his excavations. Other facts point in the same way, but we mention these paintings on stucco because they are the only specimens yet found which give us a notion of the inner walls of a great house in those primitive times, with their bright colours and rude but forcible drawing. After Tiryns he did nothing of importance.

From what we have said it will be evident that much of the hostility with which Dr. Schliemann's views were met from time to time arose from no disparagement of his discoveries, but rather from a conviction that they required a different interpretation,—that they were more important when considered simply as historical facts than when forced into connexion with the poems of Homer. He was himself somewhat to blame. But these controversies have lost all their acrimony long ago. What remains is the recollection of his splendid services.

MEDIÆVAL OXFORD.

BY H. W. BREWER.

THAT careful study of the records of the past, which has become such a marked feature of our day, has of late done much towards elucidating the antiquities and chronicles of ancient Oxford. Among the very many works which bear upon the subject, we must first mention the Rev. Andrew Clark's new edition of A. Wood's "Antiquities of Oxford." This valuable work is accompanied by numerous notes and explanations, and by a series of excellent maps drawn by Mr. H. Hurst, under the author's direction. Monastic Oxford has received considerable attention at the hands of the Rev. F. Goldie, in a modest but carefully-written pamphlet entitled "A Bygone Oxford;" and the doings and surroundings of the Franciscans in Oxford have been described by the late Rev. J. S. Brewer, in his "Monumenta Franciscana," and more fully and completely by the Rev. Dimock Fletcher, in his monograph of the Franciscan Order in Oxford. The Oxford Architectural Society has also contributed many excellent papers, carefully written by local antiquarians, who, from having been able to study various discoveries, which have been made from time to time, have added much valuable information to what was already known of Mediæval Oxford.

It would not be possible in the course of a single article to give a description of Mediæval Oxford, and the utmost that our space will permit us to do will be to describe the principal points of difference between the Oxford of the sixteenth century and the city as we see it to-day.

It may safely be asserted that no town in England can boast of any combination of street architecture so striking as the "High" and, in all probability, that noble street is more magnificent as we see it now than at any previous period of its history. Broad street, St. Aldates, and the numerous streets which combine these together, or lead out of them, are as full of noble and stately buildings as they ever were; but it is far otherwise when we come to consider other parts of the city, especially the south-western district included in the parish of St. Ebb, and the western now known as St. Thomas's.

It is quite impossible without very careful study of ancient records, documents, drawings, and the scanty fragments which remain of Mediæval buildings, when looking at this district as it is to-day, to realise its past glories. Where we now find ugly railway-stations, dingy goods sheds, grimy coal depôts, shabby rows of workmen's houses, gasworks, and all that squalid ugliness with which modern civilization surrounds a large town in its least fashionable suburbs, were formerly abbeys, monasteries, churches, colleges, and halls which were equal, if not superior, to anything existing in the best parts of Oxford at the present day. Their destruction, apart altogether from any religious question, was amongst the most shortsighted examples of waste and folly, and we can only echo Dr. Johnson's sentiment when he was shown the scanty ruins of Osney Abbey. "Sir," said he, "to look upon them fills me with indignation." What colleges might not have been formed out of Osney Abbey, Rewley Abbey, and the Monasteries of the Dominicans and the Franciscans?

In looking at our view, a vast structure, or series of structures, occupies the principal part of the foreground (see lithograph). This represents Osney Abbey as it appeared about the year 1520. At present, all that is left to represent it is a portion of the building attached to the mill at the right hand, a fragment of the foundations of the gateway at the end of the same building, a small portion of the wall near the great gate on the left, some bases, corbels, fragments of vaulting ribs, which seem to have belonged to the inner cloister, but are not "in situ," and a few encaustic tiles. There are also some fragments built into the tower of the church of St. Mary Magdalene. Even Henry VIII. appears to have had scruples about destroying this stately and magnificent pile, for, at the suppression of the monastery, he converted the Abbey Church into the Cathedral of the new diocese of Oxford, the canons and prebends being lodged in the monastic buildings, and the dean taking up his residence in the Abbot's Palace. This arrangement, however, unfortunately, lasted only for a few years, when the Cathedral establishment was transferred to Christchurch, and Osney was handed over to ruin and destruction.

Our readers will naturally ask, what authority is there for the restoration of this great building, which has now completely disappeared? In the first place, I must acknowledge my obligation to Mr. H. Hurst, whose name has been previously mentioned, for kindly giving me a rough plan showing the positions of the various discoveries which have been made from time to time while digging the graves in the cemetery, which covers the eastern and northern portions of the site. From these it has been possible to trace the enclosure of the inner or smaller quadrangle, the position of one of the buttresses of its cloister, the position of the great west tower of the church, of the conduit in the western courtyard, and the building called the "Domus Dei," near the great gate. And now as to ancient authorities. William of Worcester gives us the dimensions of the church as he saw it in 1480; but, unfortunately, his mode of measuring buildings is not very reliable, as it is simply given in paces, "gressus," and, when he does condescend to use the word feet ("gradus"), he rather adds to the confusion. However, taking his "gressus" at 24 in.; and, making allowance for the confusion between "gressus" and "gradus" with regard to the western tower, Mr. Goldie calculates the extreme length of the church at 360 ft., the width at 100 ft., which he conjectures to have been measured at the transepts, but here we think he is in error, because Wood states distinctly that the church had double aisles, and, although 100 ft. might be too great a width for a nave and aisles, it might not be at all out of the way for a nave and four aisles. It is probable that William of Worcester has somewhat exaggerated the length of the building, because, although Yates in 1804 tested the "gressus" of William of Worcester, and found that in the case of the remains of the Abbey Church of Bury it worked out at slightly more than 24 in.; yet, in his measurement of New College Chapel, if we take the "gressus" at 24 in. it makes the church considerably longer than it actually is. Comparing, however, other abbey and priory churches erected by the Canons-regular in England, we find that, as a rule, they vary from 228 ft. to a little over 300 ft. Christ Church, Hampshire, which is the most perfect example handed down to our time, is 311 ft. long, so that, making all due allowances for inaccuracy or exaggeration on the part of William of Worcester, the abbey-church of Osney was in all probability not far short of 300 ft. in length. In the works of later writers we find a considerable amount of information concerning this vast building. It would oc-

cupy too much of our space here to copy down the various descriptions given by Hearne, Wood, Peschel, Turner, and others, but if we summarise what they tell us, we find the following particulars. The church was cruciform, with a lofty tower at the west end and another over the crossing. It had four aisles, and contained twenty-four altars in addition to the high altar (so that probably the outer aisles were subdivided into chapels as in Continental cathedrals). There were two lady chapels, one to the east, and the other to the north. The great gate was to the north, with a smaller gate more to the east, and between these stood a building called "the Domus Dei," where poor pilgrims were entertained and lodged.

To the west of the church was a very large quadrangle of cut-stone (said by some writers to have been as large as the Tom quad at Christchurch). A cloister went round three if not four sides of this quadrangle, which had a flat, boarded roof. The refectory was on the south side of this quad, and was approached by a great stone staircase. The kitchen was to the west of the refectory, and the infirmary with its chapel to the south. To the north-west of the great quadrangle were the Abbot's lodgings, which contained a great hall, also approached by a wide staircase, and the great parlour, kitchen, other offices, and chapel. Dormitories and a school-house are also mentioned, and Turner, in his Oxford Records, mentions a vast number of offices which were made over by Henry VIII. to Stump, of Malmesbury, whose name is associated with the destruction of the Abbey buildings of his own town. Among these offices are a bake-house, a malt-house, a cook's-house, timber-yard, &c. Most of these were situated in the range of buildings by the mill, which, until their destruction towards the end of the last century, went by the name of the Canon's Building.

Comparing this description of Osney Abbey with plans of monasteries erected by the Canons Regular, given by Somern and Ravenstein, "Brabantiæ Sacra," &c., we are enabled to suggest the probable uses of many portions of the edifice. The great cloister to the west is, in some of these monasteries, figured as "Ambitus Laicorum," the smaller cloister by the side of the church as "Ambitus Sacerdotum." The building between the two is the lay-brother's dormitory,—those of the choir monks surround the inner cloister or "Ambitus Sacerdotum." The guest-chambers for the men, "Diversorium Virorum," are round the west cloister, and those for the women, "Diversorium Feminarum," near the gate. All the offices, farm-buildings, &c., form a different range of buildings, and the infirmary with its chapel stood near the great court. The Abbot's house generally had its separate court. All this accords with what we know of Osney.

Now we must consider the pictorial evidence. The earliest representation of Osney Abbey which I have come across is a tracing from a manuscript drawing contained in some papers kindly lent to the writer by the Rev. F. Goldie. Unfortunately the reference to this is lost. It shows, however, a gate, with a tower of the church rising over it, crowned by a short lead spire. This feature has been adopted in my restoration. The next representation is in the stained-glass window commemorating Bishop King, last Abbot of Osney and first Bishop of Oxford, erected in 1551. This shows a portion of the ruins of the church, consisting of the central tower, with the weatherings marked upon it of the nave and transept, and a series of lofty pointed arches, evidently intended to represent the nave-arcade. From this we are able to see that the latter was semi-Norman, that the church had been greatly heightened at a later period, probably by Abbot Leech, who rebuilt a large portion of the church and monastery about the year 1247. The portion of the tower which after this alteration was visible over the roof, had two large windows in each face, and little ones, almost loops, above them. Buttresses run up at the angles showing that there were pinnacles.

In the Wood collection at the Bodleian is a coarse pen-and-ink sketch, entitled "Prospects of the North Side of the Ruins of Osney Church," 1574. This was discovered by Wood, and is referred to by him as "the draft," but it is not so trustworthy as the representation in Aggas's view of Oxford, dated ten years later. The two towers were both in existence when these views were made, and the walls of both the nave and choir. In Agas the great gate is shown opposite the western tower to the north, and the latter has a large doorway, which communicated with the porch, the parapets and pinnacles of which are recorded to have been thrown down by one Poppynge-Jay, at the dissolution of the Abbey. The same individual seems to have been busy at about the same time in removing the choir stalls and the lead from the roof. The site of the great court is indicated to the west of the church and the "Canon's buildings." The most valuable, however, of all the views of Osney is that to be found in a few copies of the first edition of the Monasticum.

In the Ballard collection, at the Bodleian, we are informed that it was one of a series of drawings of Osney, made for Sir John Aubrey at the cost of 20s. by one Hesketh, a Hedge priest. Now this same "Hedge priest" must have understood a great deal more about Gothic architecture than most of the draughtsmen of his time, because he and Hollar, the engraver, have between them left us a very reliable and valuable representation of the great Abbey, as it appeared in their days, just immediately before the entire destruction of the ruins of the church, in 1644, by Charles I. to complete the fortifications of Oxford, against the Cromwellians. This engraving shows the ruins from the south-east; the great west tower of the church is complete. The upper story was evidently Perpendicular work, and is covered with panelling, the whole crowned by an open parapet. The tower lights are very long and narrow. As in the centre tower, the evidence of a lofty clearstory having been added at later times is very distinct. The lean-to end of the inner south aisle is shown attached to the west end of the tower, and near it a plain gable, which must have formed the west-end of the outer aisle. Part of the wall of this aisle is shown with what looks like the remains of a Norman Triforium. The west side and gable end of the south transept were pierced by very long Decorated or Perpendicular windows; attached to the south end of the transept is a large chapel or sacristy with a doorway which seems to have communicated with a vestibule of the chapter-house. At the angle of the nave and transept the remains of the Norman triforium are visible; to the south of the site of the chapter-house is shown a lofty Early English gable pierced with a triple lancet window very high up, and a crypt beneath this was probably the school-house. In the Gough collection at the Bodleian is a water-colour drawing from almost the same point of view, and an etching which was probably copied from it. The "Exeter Benefactor's Book" shows a view of the church from the north-east, showing both towers, but, as it is made in 1721, it can only have been a second-hand affair. There are also drawings of the ruins in the *Gentlemen's Magazine* and the collection of the King's Library in the British Museum. In "Steven's Continuation to Dugdale," and in the King's Library collection, are views of "the Canon's building," from the east and west points of view. The bake-house, "kyll" (malt-house), and a whole range of buildings lit by square-headed windows, is also shown. An engraving, dated 1818, shows the old mill and the buildings between it and the kitchen. What at present exists of these buildings is represented in a sketch by the writer, published in "the Oxford Supplement of the *Graphic*" a few years back. Much as we should like to dwell at greater length over this interesting portion of the subject, we must hurry on to describe other Mediæval structures.

To the north of Osney Abbey was the suburb of St. Thomas (in early days known as St. Nicholas). The old church still exists, and is the solitary example of ancient ecclesiastical architecture now left in this dreary region. The principal street or lane, called the "Hamel," led from St. Thomas towards the castle. A lane to the north of the Hamel led to the gateway of Rewley Abbey, which belonged to the Cistercians. Of the outer gate, or rather its ruins, a number of views are to be found. It had two arches, the larger of which was ogee in form, and was adorned with carved scutcheons, &c. An avenue of elms led from this to an inner gate, which seems to have led into a court, which was surrounded by buildings, views of which are to be seen in "Steven's Continuation," the King's Library collection, &c. These were, I think, the Abbot's lodgings, guest hall, &c., because they must have been north-west of the church, the position of which was ascertained by the discovery of the foundation-stone about 1706. Of the church itself no representation exists. Wood tells us that it had a spire, an uncommon feature in Cisterian churches; probably, however, it was only a kind of wooden capping to the centre tower. The views of the monastic buildings show that, although they were on rather a small scale, they were fairly rich decorated work. A solitary doorway is all that now exists of Rewley; this is represented in a drawing made by the writer in the Oxford Supplement of the *Graphic*. Crossing over Hithe Bridge, and turning to the north we should have found two very interesting buildings. The first was called "Gloucester College," and was the head-quarters of the Benedictine monks in Oxford. The lower or garden quad of Worcester College still exhibits considerable remains of this ancient college. The chapel, erected in 1420, was of important dimensions, adorned with magnificent stained glass, and dedicated to St. Benedict, but was completely destroyed at the Reformation. To the north-east of Gloucester College stood another fine Mediæval edifice called "Beaumont Palace," which was a royal residence, and Richard, "the Lion-hearted," was born within its walls. Edward II. made over the building to the Carmelite Friars, who, in the reign of Henry V., erected here a stately church, the tower of which, says Mr. Goldie, marked the site of the chamber in which Richard I. was born. Some fragments of the wall may be traced, which possibly belonged to this structure, though even when Aggas made his view of Oxford little save one of the gateways would appear to have been in existence, and that not the principal one, which was at the opposite end of the ground, near St. Mary Magdalene's Church, where we still find the name, "Friars' Entry." In the King's Library, British Museum, are drawings of some remains of the building during the last century. They seem to have consisted, for the most part, of a very beautiful semi-Norman crypt.

The large suburb of Oxford which stretched out from the gate, called the "Bocardo," close to St. Michael's Church, contained many collegiate and ecclesiastical buildings, several of which still remain, as St. Bernard's College, now St. John's, St. Mary Magdalene's, and St. Giles's churches; here also stood "Black Hall," "St. Margaret's Hall," "Greek Hall," "St. Mary Magdalene's Hall," and many others, of some of which the buildings have disappeared and others are converted into dwelling-houses.* Baliol College existed at the time of which we are speaking, and under the name of "Durham College," the masters' lodge and adjoining buildings of Trinity. Where Wadham now stands was the church and monastery of the Augustinian friars, and here we have again an example of the short-sighted absurdity of the destruction of the monastic buildings of Oxford, for this stately monastery cannot have disappeared half a century when it became necessary to erect the buildings for a college on its site. There may be a doubt, by the way, whether the

* Mr. Clark gives the names and situations of eighty-four halls which existed in 1440.

gateway of Wadham may not possibly be a portion of the old monastic buildings very considerably "cooked up." The details of the bow window and staircase are very unlike Jacobean work, and show a marked difference to any other portions of the building.

Not far from the Austin-friars, at Smith's-gate, which formed the second entrance to the town on the north, stood a curious little structure, called "The Chapel of Our Lady," which appears to have been circular or octagon in plan, recalling to one's mind the "Lady Chapel on the Mount," at Thetford. It appears to have been in existence when Aggas made his view of Oxford. Still continuing outside the walls by Holywell-street we should have found a series of great fish-ponds. The abrupt turn to the right at Crowell would have brought us to the east gate of the city, which stood near the present Botanical Gardens. Magdalen College, with its beautiful tower, stood in the suburb of East Gate, and must have looked singularly beautiful with the old Gothic bridge and causeway beneath it. Nearer to the gate of the city stood the monastery of the Trinitarian Friars, and at the opposite end of the bridge the quaint old church of St. Clement, which possessed an extremely picturesque gabled tower, a watercolour drawing of which is to be seen in the King's Library, British Museum.

Another causeway leads up to the east gate from Milham Bridge, the ruins of which may still be seen. Passing a chapel called "Our Lady on the Wall," the neighbourhood to the south of Oxford, between Millham Causeway and the great entrance to the town, called "Grandpont," the site of Christchurch meadows, appears to have been intersected by a number of streams and watercourses.

"Grandpont," now called "Folly Bridge," was the most important approach to Oxford, and upon this ancient bridge stood a gateway, surmounted by a tower, which went by the name of "Friar Bacon's Study." Perhaps that illustrious scholar may have used it as an observatory.

Crossing Grandpont Bridge, on the left we should have found the gateway of the Dominican or "Black Friars'" Monastery. This was one of the most important Monastic institutions in Oxford, and possessed a spacious church and a large school or college attached to it, it was also the residence of the Bishop of the diocese, upon the occasion of his visits to Oxford, so that it may be regarded as a combination of monastery, college, and palace. The buildings, however, had almost disappeared in Agass's time, but some drawings of the gateway and adjacent structures as they existed in the last century may be seen in the King's Library.

Continuing up Grandpont-street past the picturesque front of Littlemore Hall, the remains of which still exist, we should have crossed over Trill-Mill-Stream, and should have had before us a very steep ascent called "Tower Hill," on the top of which stood the south gate of the city, with the Church of St. Michael-South-Gate almost adjoining it to the right. A little within the gate on the left we should have recognised St. Aldate's Church, but to the right we should have looked in vain for the stately front of Christchurch, which was not commenced until two or three years later.

St. Frideswydes-street would have conducted us to the great monastry bearing that name, with its noble church, the remains of which serve now as the cathedral of Oxford. A part of the cloisters, refectory, and the chapter-house, which still remain, serve to show us the elaborate character of the buildings which formed this monastic institution. Within the walls of the city we should have found many objects with which we are familiar. Among the colleges we should have been able to distinguish Merton, Corpus, Brasenose, All Souls, New, Lincoln, and Exeter, though very much smaller than they are at present.* Queen's and Oriel were there, but the present buildings are very unlike those which existed in the sixteenth century. Judging from Loggan's view, Old Queen's must have been a most charming Gothic building, possessing a chapel, with very elegant curvilinear Decorated windows. Another beautiful little building was Canterbury College, which stood on the site of the Canterbury-court of Christchurch. Great University Hall, and St. Mary's College, near the Castle, were also beautiful examples of Mediæval collegiate architecture. All Saints' Church, which occupied the site of the present one, was an interesting-looking edifice, several drawings of which exist, it had an embattled tower, crowned by a lofty spire, which looks, from the drawing, as if it were of wood covered with lead. Drawings also exist of the churches of Carfax and St. Ebb, both of which were picturesque buildings. Close to St. Ebbs' Church stood the great monastery of the Franciscans or Grey Friars. The site is not quite clearly ascertained, though it appears to have been within a triangle between the west gate, the little gate, and St. Ebbs' churchyard.

There is a place here still called "Paradise-gardens" and "Paradise-square," where formerly stood a small monastery of the Penitential Friars, or "Friars of the Sack," who were suppressed in 1309 and their site given to the Franciscans. The word "Paradisus" was frequently applied to portions of old monasteries and churches, and it is by no means improbable that this formed the gardens of the Franciscan monastery. The Friars seem to have obtained permission to alter the city walls so as to make them enclose their convent just as the Monks of St. Freidsweide had previously done. William of Worcester gives a description of the church, which appears to have been a vast cruciform structure some 300 ft. in length!

Close to the Franciscan monastery stood the west gate of the city, and a fortified bridge near to it led to the castle. Of this magnificent Norman building little now remains, except the bell-tower, which appears to have belonged to the Collegiate Church of St. George, which stood within the castle enclosure, rather than to the castle itself. The same may be said also with regard to the Norman crypt which was rebuilt some years back. Attached to this church was a college of priests, called St. George's College. Numerous views and plans of the old castle exist, and may be seen in "Munimenta Antiqua," Woolnoth's "Castles of England," Ingram's "Memorials," and drawings in the Kings' Library, British Museum; these latter show the remains of the Collegiate Church of St. George, and from them it would appear to have been a Norman building, with an apse at the east end, one transept, and a central tower in addition to the great campanile still existing. Like Merton, this church was parochial as well as collegiate, and had a parish attached to it. In early times there were two other parishes to the south-west of the castle, the sites of the churches of which have been ascertained; they were "dedicated" to St. Benedict and St. Budoc. The former stood upon the site which, later on, was occupied by the house of the penitentiary Friars, and St. Budoc's was close up to the castle-moat. Now, this would lead us to the conclusion that, before the fourteenth century, there was a large suburb of Oxford spreading out towards Osney in one direction, and the Thames in the other, and, possibly, covering what is now known as "King's Mead" and South Osney Isle. When and how it disappeared is impossible to say, but we know that both churches and inhabitants had gone before the sixteenth century. It seems as though the "Black Death," or some of those terrible visitations which decimated the population of our great towns, had here been active, the marshy soil, intersected by streams, and often covered for months together by water, would have proved a powerful ally in the work of destruction.

Of course it has been found impossible in the length of this article to give more than a very cursory glance at Mediæval Oxford. Nor have I been able to mention the names of more than one or two of those gentlemen whose unsparing industry in studying records and remains of ancient Oxford have enabled me to produce the drawing which appears in this copy of the *Builder*. I cannot, however, conclude without expressing my thanks to Mr. H. Hurst and the Rev. F. Goldie for the kind way in which they have assisted me in the research necessary for the purpose, and to Mr. Madan, of the Bodleian Library, for information concerning the drawings, &c., contained in that institution. H. W. B.

* Their original appearance may be gathered from the views of Neal and Loggan.

THE GUELPH EXHIBITION.

IN spite of what has been claimed for it in advance, it can hardly be said that the Guelph Exhibition at the New Gallery, opened this week, has the same interest as the Stuart and Tudor exhibitions, either artistically or historically. In regard to artistic merit the names of Reynolds, Gainsborough, and Romney were advanced in the prospectus as promising great things, but the works of the first importance by these great painters are not very largely represented: and in the matter of decorative work the period illustrated was not likely to produce anything of so much interest as was found in connexion with the Tudor period.

The walls of the three galleries are hung mainly with portraits. One of the first to arrest attention in the West Gallery, where the numbering as usual commences, is Kneller's very clever portrait of George I. in a costume in which red predominates (6), and which is an exceedingly effective painting. The same painter's "Second Duke of Grafton" (9), a half-length showing an exceedingly feminine-looking face under a blue cap, is another work of considerable originality. Kneller is pretty largely represented in this room. By Hogarth there is an interesting half-length of the painter's sister Anne (20), and a curious group in the House of Commons (40) ascribed jointly to Hogarth and Sir J. Thornhill, the latter of whom we may presume painted the architectural surroundings of the Speaker's chair, which are unfortunately very badly drawn. The well-known picture of "Fox Addressing the House of Commons" (95) is also to be seen in the North Gallery; a work which was exhibited at Burlington House a few years ago, and which is more interesting historically than pictorially; no painter's name is suggested for it. Gainsborough's full-length portrait of George III. (51), standing in a park with his back to a portico, is a fine example of its class, and forms one of the central features in the room. Superior to this however, is the same painter's half-length of George IV. as Prince of Wales (54), a portrait of great vigour. Copley's painting of the children of George III. (67), well known from engravings, maintains its reputation well, and is full of life and animation in the figures, besides possessing other pictorial merits.

In the North Gallery a painting of William Pitt as a youth (105), anonymous, attracts attention by its fine colour, and the easy and natural attitude of the figure reclining back on a bank; the painting has much of the kind of merit peculiar to Gainsborough, whose style certainly influenced it. Opie's half-length of Burke (106) is a powerful work in which great force and character are imparted to the head. Reynolds's half-length of "The tenth Duke of Hamilton" (107) is another noticeable portrait; and still more so Gainsborough's half-length of Canning as a youth (110), with a delicate and almost girlish beauty, very finely painted. His "Fifth Earl of Chesterfield" (123), the one to whom the second and recently published Chesterfield letters were addressed, is a work in Gainsborough's finest style; the figure is seated in a landscape caressing one of the dogs which Gainsborough painted so well and lovingly. Another of the exceptional works in this gallery is Reynolds's beautifully composed group of the Duchess of Gordon and

her son (131); the two figures are seated together on the right, the youth a little behind his mother, the two heads brought together and finely contrasted. Of Nelson there are various portraits, of which the one by Rigaud, odd-looking enough and not a fine specimen of painting, is nevertheless highly characteristic in its boyish expression; a letter from Nelson is quoted in reference to it; "as to my picture it will not be the least like what I am now, that is certain," and in fact it rather suggests the remark of some one about Nelson in his younger days, that "he looked the merest boy of a captain I ever saw:" but he was admiral at the date of this picture. T. Phillips's half-length portrait of Napoleon (54) is powerful and lowering in expression. Hoppner's Duke of Wellington at the time when he was Colonel of the 33rd would hardly be recognised as a Wellington portrait, the well-known and characteristic features and expression are hardly to be traced in it. Weigall's full-length of the Duke as an old man (157), hung above it, though hard in texture and commonplace in an artistic sense, has the merit of dignity in attitude and expression. Gainsborough's portrait of beautiful Miss Linley (Mrs. Sheridan) and her brother (167) should not be passed over.

The South Gallery contains portraits of poets and other literary and artistic celebrities, many of them popularly known through engravings: Prior with the "night-cap" which formed the literary man's undress (197), Pope similarly decked (204); the portrait of Johnson without his wig by Reynolds (205), the same painter's well-known half-length of Goldsmith (211), Raeburn's massive and massively painted head of Scott (215), Romney's of Cowper, with the red night-cap; Reynolds's well known and *spirituel* portrait of Dr. Burney, holding a roll of music is in this room (269); and his large likeness of Foote the comedian, whose coarse features fully explain the contemptuous expressions of Johnson about him, recorded by Boswell. Hogarth's charming portrait group of Garrick and his wife (252) is also conspicuous, and the centre of the room is occupied by Reynolds's well known and rather stagey Mrs. Siddons as the Tragic Muse (245). As far as the portraits are concerned this is the most interesting gallery of the three, in artistic and other senses.

The cases containing various classes of objects are not the least important part of the exhibition. Miniatures, a class of work of which the personal and historic interest is so great, are largely represented. On these we do not dwell here, their interest is not artistic save in a very limited sense, though we no less appreciate them in another sense. The first case in the West Gallery contains a large collection lent by the Queen and other members of the Royal Family. Case B is of more varied interest. The high-heeled satin shoes take us back to the days of a different and more dainty and conventional social life than the present; the embroidered waistcoat stirs weak regrets in the mind of man that all the adornments of this kind should now be monopolised by the other sex. The silver salver designed by Hogarth and presented to Sir Robert Walpole by the Corporation of London is not of the best order of decorative art, as may be supposed: a view of London is engraved on a portion of it. Case C contains various relics of rather historic than artistic interest. Case D contains a valuable collection of miniatures, and E a miscellaneous collection of such things as snuff-boxes, bonbonnières, &c. Some of the French examples of the latter are charming knick-knacks; numbers 642 and 645 especially. Another case of miniatures may be noted, and the central case, G, is occupied by plate. Little of this is of any note artistically, except a silver centrepiece designed by Flaxman (827), an open-work silver bowl of graceful outline, supported on three little caryatides who join hands through the medium of wreaths held between them. Of other works the least ornamented are the best in artistic spirit; a good silver cup may be noticed (817), of a pattern common in the Georgian era, the bowl plain above and fluted below.

In the North Gallery case H contains relics of great interest as such, including the contents of Napoleon's travelling dressing-case, taken from his carriage at Waterloo. The silversmith's work was executed by Brennais for the Emperor, and is really artistic in spirit; little ornament, but that little refined and delicate. The series of Battersea enamels in case I is of real interest, and brings together a representative collection of a very admirable school of work of its kind. The set of three square blue caddies (898) are especially good and artistic in feeling. A large collection of miniatures, lent by Mr. Jeffery Whitehead, meet us in case J, and in K a similar collection lent by Dr. Propert, the Earl of Dartrey, and Sir Julian Goldsmid, including a curious one of Cosway by himself, in which he is got up in a kind of costume à la Rubens. "Relics of Nelson and Wellington" in case L is in a sense one of the most interesting items in the collection, but not in the artistic sense, certainly; and even in a "relic" sense "a ring of Copenhagen's snaffle" seems going rather low in the scale of reliquary worship, though Copenhagen is a historical horse, no doubt. The collection of watches from the 16th to the 19th century is of much interest, and some of them are beautifully and delicately ornamented, though there are no examples of that exquisite fancy which we noted in regard to a collection of old French watches in the Trocadéro a year or two back. The various ways of finishing a watch (externally) are interesting to compare, and it will probably be a new fact to many that at one time it was customary to make the back of the case of tortoiseshell. The examples are not dated. Of the collection of plate (N) in the middle of the room, the best is again the plainest, a large and massive loving cup (1,225) belonging to the Salters' Company, fine and sumptuous in outline, with no ornament except the Company's arms delicately engraved on the side of the bowl. Two German tankards, "rich and rough" with alto-relief compositions, are powerful and effective if not refined; and the large silver cup presented to Nelson by certain merchants, in commemoration of the battle of the Nile, is a fair piece of work, sumptuous in appearance if presenting no very original character.

In the central hall are some fine collections of Wedgwood china, and, what is of more interest, tablets of Wedgwood (on the screen), classic bas-reliefs, &c., in some instances known to be, in most instances presumably, the design of Flaxman: some of these are very beautiful. Another collection of watches is to be found here, which we have not time to examine; some arms of various interest, historic and artistic: a tolerably large collection of fans; and a case (V) of historical English china, among which pieces of common crockery inscribed with the names and portraits of Howe and Nelson, names of the ships in the battle of Trafalgar, &c., serve to remind us that England was once a great nation.

KAYE'S LOCKS.—The business of Messrs. Joseph Kaye & Sons, lock manufacturers, Hunslet, Leeds, and 93, High Holborn, London, has recently been converted into a limited company for the purpose of developing and bringing into use the many inventions of which the patents are owned by the Company. Amongst the best-known of these may be mentioned the "Push-and-Pull" lock.

BIRKBECK LITERARY AND SCIENTIFIC INSTITUTION, Bream's Buildings, Chancery-lane.—The Winter Term of this old-established Institution will open on Monday next. Over 200 classes meet weekly in commercial and technical subjects, Mathematics, Natural, Applied, and Mental Science, Languages, History, Literature, Art, Music, Law, &c., &c. On Wednesday evenings lectures will be delivered in the large Theatre of the Institution. Amongst those who are already engaged may be mentioned Sir Robert S. Ball, Professor S. R. Gardiner, Professor C. V. Boys, the Rev. A. Boyd-Carpenter, Miss Amelia B. Edwards, Mr. Samuel Brandram, M. Max O'Rell, Mr. J. T. Carrodus, Mr. Herbert Ward, Mr. Lawrence Kellie, Mr. Charles Fry, Mr. Eric Stuart Bruce, and Mr. Wilmott Dixon.

NOTES.

OF all times in the year, the holiday season is the worst for a railway strike,—both for the companies concerned and the public. Accordingly, a number of the *employés* on the Scotch lines have recently struck work; thereby causing a great deal of confusion, and, in some districts, a complete stoppage of the traffic. Both the passenger and goods train services have been more or less suspended for want of drivers, &c., and notices issued by the companies intimate that goods traffic can only be accepted on condition that they shall not be held responsible for delays. As the chief demand of the strikers is for shorter hours of labour, they have the sympathy of a considerable section of the general public; and the directors have further to face the fact that their neighbours, the North-Eastern, have just given way to a similar demand from their men, and thus averted a strike on that line. The officials have, however, succeeded in engaging a large number of substitutes, and seem very disinclined to give way. Seldom has the Christmas season been attended with so many inconveniences to the railway companies generally, owing to the combined influences of the severe weather and the disturbed and unsettled state of the men. To be deserted just at a moment when extra assistance is always needed at all the large stations is particularly harassing, besides the anxiety which continued frosts and fogs entail upon the officials. Added to this, the work at some of the large London forwarding depôts has been considerably retarded by sudden failures in the gas supply,—due, doubtless, to the inclemency of the weather,—and altogether the work has been carried on under the most adverse and trying circumstances. The effects, of course, are very widespread, the disorganisation of railway working involving delays to traffic for places far remote from the particular station or line primarily affected, and it is very doubtful if Christmas Day found all the traffic disposed of which should have been cleared off before the holidays.

REFERRING to the International Art Exhibition to be held at Berlin next summer, we hear that the programme drawn up by the committee in charge of affairs has now been definitely decided on, and that it will be sent out a few days hence. It is hoped that the exhibition will be an international one in the proper sense of the word, without being subject to political influence, and arrangements will be made that the exhibits of the different countries will be placed together forming distinct groups, of which the German one will alone be subdivided according to the headings, Berlin, Munich, Dresden, Düsseldorf, Weimar, and Karlsruhe. All original paintings and water-colours, pieces of sculpture, architectural designs, and black-and-white work will be eligible for exhibition; a few extra divisions for illustrated publications on art subjects, painted fans, artistically decorated documents and addresses being, however, suggested, and a few special invitations for the purpose of obtaining a select arts-and-crafts room may be issued. Prizes will be given in the form of gold and silver State medals, diplomas, and recommendations, and these are to be adjudged by a jury, the exact formation of which cannot be made out till the number, &c., of exhibitors and their nationalities can be approximately known. Measures will be taken to assist exhibitors in sending their work, and arrangements have been made as to the insurance of exhibits whilst at Berlin, the whole of which will be insured by the Committee for a lump sum not under 400,000*l*. A sales office for the exhibits will be formed, at which a commission of 7 per cent. of the sale price will be taken for office expenses. The opening-day of the Exhibition is fixed for May 1, and it will be open for four months. Architectural work will be found room for, and there is a special paragraph in the programme permitting de-

signs for buildings, &c., and also mural decoration, to be exhibited in photograph form; and there is no reason why English architecture and draughtsmanship should not be well represented at the coming Exhibition, and the English success at the last summer's Munich Art Exhibition be repeated, or even improved upon.

THE career of Dr. Schliemann (referred to more at length in another column) is a practical proof that the endowment of research is not necessary in order that research may take place. The great archæologist, having made for himself a competence in business, and having educated himself, discovered for the modern the treasures of the old world. In another sphere of work Darwin made discoveries, and gave his time to the most patient research, without any so-called endowment. We may well doubt, therefore, whether any scheme for the endowment of research would be of real practical value. If research is to be in any sense endowed, it should be by giving assistance to men who have shown the value of their work, and who, it is clear, can do yet more with adequate assistance over and above their own resources.

A QUESTION addressed by Mr. Richard Chamberlain to the President of the Board of Trade as to "a long-continued default of the Chelsea Electric Supply Company to furnish the statutory current of 100 volts, and to the serious loss of illuminating power sustained by consumers in consequence," has led to some very miscellaneous correspondence recently in the press, through which many users of the electric light make known their grievances against the particular company supplying them. Puzzling and contradictory as the letters are, most curious is the statement that the volt, or unit of the electrical pressure, is still an indefinite quantity, and hence it is impossible to determine whether a company does or does not maintain a pressure of 100 volts. in its mains. This is one of these side issues in which the pseudo-scientific writer seems to delight, and which has absolutely nothing whatever to do with the main question. In the metric system, the unit of length is the mètre which is defined as the ten-millionth of the quadrant of the meridian of Paris. Owing to experimental errors in the determination of the mètre, the mètre now used is probably wrong by about one two-hundredth of an inch. Is it, then, true that if a trader in France agrees to sell 100 mètres of any commodity, the purchaser cannot determine whether or no he gets what he pays for? The "volt" is in much the same position. What is meant by the volt, that is the definition of the volt, is as clear as that of the mètre, but like the mètre it is exceedingly difficult to determine it absolutely. From what one has been reading lately it might be thought that an incandescent lamp gives its proper light at 100 theoretical-volts pressure and none other. This, of course, is utter nonsense,—lamps can be made which shall be properly incandesced at almost any pressure within limits. All a householder requires is that his supply company shall keep a pressure in their mains sufficient to properly illuminate his lamps, no matter by what particular number they may choose to denote that pressure. An electric supply company can no more keep the pressure in its mains absolutely constant than a gas company, but if the pressure never varies more than 4 per cent., it is constant enough for all practical purposes. One writer makes the excuse that volt-meters do not always indicate the same. This is true, nor does the average watch continue to indicate the right time. A man, therefore, "standardises" or determines the error of his watch by comparing it from time to time with some clock which does indicate Greenwich mean time. We learn that the House-to-House Company, which is specially commended for the constancy of its supply, periodically has its instruments checked at the Electrical Standardising Institution in Charing Cross-road, and that experience shows them that this constant checking is very necessary. Yet this does not mean that when the House-to-House Company professes to furnish 100 volts it does so to the letter. What it does is to maintain an *unknown*, and at present *unknowable*, pressure x between its mains, which x, however, is known to be very nearly 100, and is, therefore, called so. The real point is that, whatever the absolute value of x may be, the Company does not allow it to vary beyond unavoidable and inappreciable limits. This is all the public require. Nobody ever wants to know the pressure at which his gas is supplied, provided only the pressure is suitable and constant and does not make the gas-flame roar one moment and burn dimly the next. *Mutatis mutandis*, this is all the user of the electric current should ask for.

THE proposed new trunk line of the combined Manchester and Sheffield and Metropolitan Railways has always attracted much notice. Last week the Bill was approved by the shareholders of the first-named company, and it was condemned by a meeting of the residents of St. John's-wood. It is obvious that, as regards the eighty miles of new line required to unite the two existing systems, this part of the Bill will receive the approbation of a Committee of the House of Commons. It can only be opposed by the North-Western Company, and this missing link is certain to be approved. But the real fight will be over the terminus. We think good reasons can be advanced against a new terminus in St. John's-Wood. The proper terminus from every point of view is the site of the existing station at Baker-street; of course, much enlarged, and with two or four more additional lines of rail. But it will be necessary that the arguments should be placed before the Committee on this point, and we can scarcely think that they will attach much weight to the artists' plea that St. John's Wood is a secluded residential suburb, since, as a matter of fact, it is a general residential suburb, among the residents in which artists are by no means in a majority.

AN important fact in regard to the wear of railway rails is notified and illustrated in the last number of the *Engineer* (quoting, however, from the *Railroad Gazette*). Two sections of the same rail are given showing the comparative wear of the rail, in a period of seven years, in a tunnel and on the open railway. The difference is very remarkable. The rail laid in the tunnel has lost nearly half the area of the lower flange, the rounded extremities are pared down to knife-edges, and about one quarter of the area of the upper flange is eaten away, more on one side than on the other, leaving an irregularly-shaped mass. This alarmingly-increased wear and disintegration in the tunnel is of course due to atmospheric causes; but if this case is taken as establishing the general tendency of rails to behave in this way in tunnels, it is a fact of serious importance in regard to the laying and maintenance of tunnel roads. A tunnel is exactly the place where one may suppose that a defective condition of the rails might most easily escape observation; yet it appears that this is where it is most likely to occur within a given space of time.

THE recent annual report of the Metropolitan Public Gardens Association gives evidence that that most useful Society keeps steadily at work. The efforts are the more praiseworthy because it has to meet with many rebuffs. It is in many ways ubiquitous. While the Society is properly endeavouring to induce the Charity Commissioners not to appropriate for other purposes the fund hitherto used for keeping up St. Botolph's Garden, Aldersgate-street, it is preparing to lay out Sidney-square, Commercial-road, and to secure a particular open space in Bromley. Its continuous and judicious efforts have improved the appearance of the metropolis, and have added to the health of many of the inhabitants of London, and not a little to the small enjoyments of hundreds of the old and young of the poorer classes. No society deserves greater sympathy and support. Of the architectural value of the work done by it, there is no stronger proof than the advantage to the Law Courts of the laying-out of the open space at the west side. There is, indeed, no question that it would be a first-rate metropolitan improvement if the houses of Bell-yard and of the west side of Chancery-lane were demolished, and the space between the Courts and the east side of Chancery-lane left open, and handsome buildings erected in place of the miserable erections which now run up the lower end of the east side. But whether public spirit will ever carry this improvement is a matter of doubt. It is equally certain, also, that the south side of New-square, Lincoln's-inn, ought long ago to have been demolished, and then there would be one of the finest open spaces of London, with the Law Courts at its southern end. The public spirit of the Honourable Society of Lincoln's Inn will, we hope, one day effect this much-needed improvement.

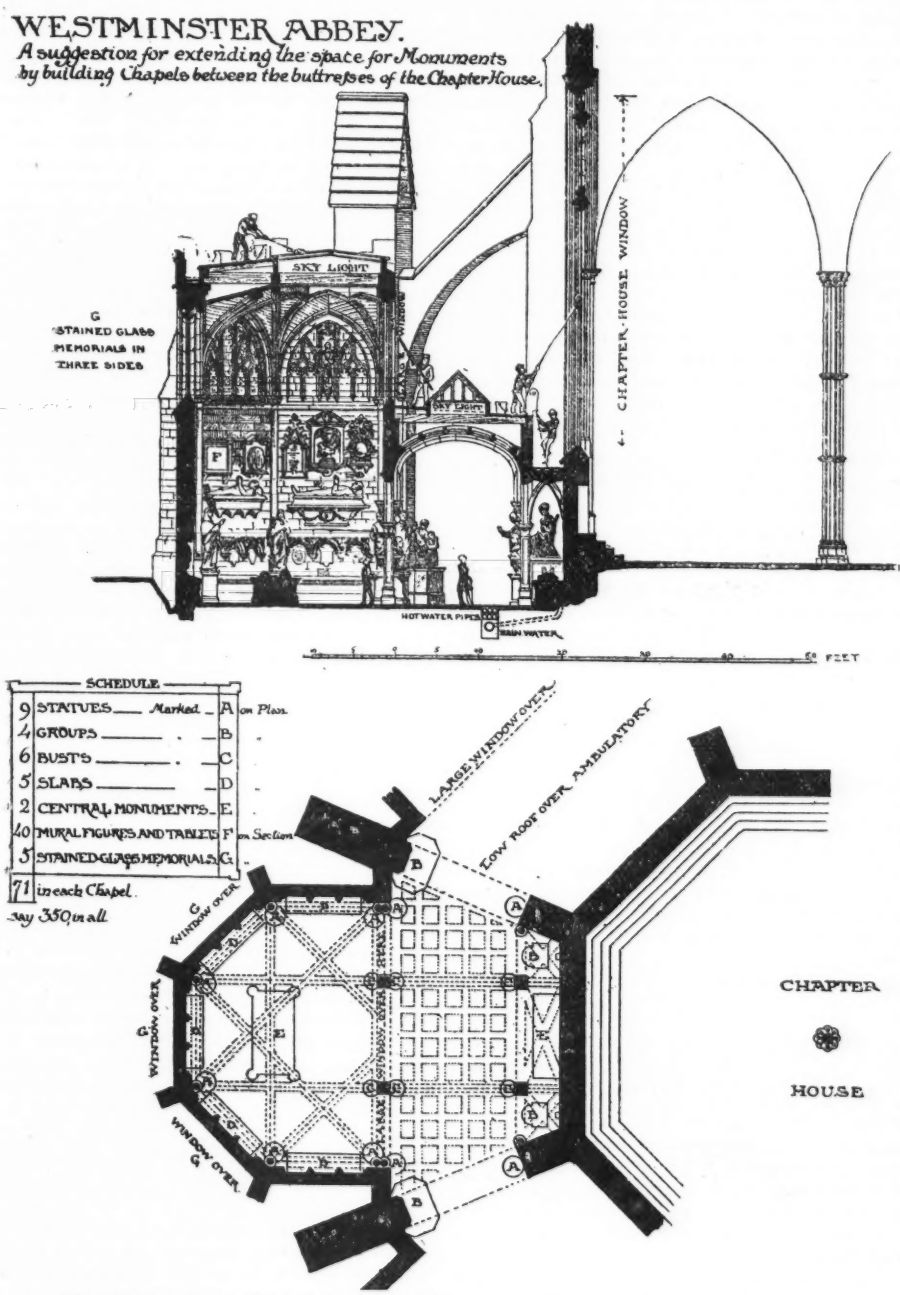
IN another column will be found a report of the case of the London County Council *v.* Knowles, in which the question was raised, "What is a permanent structure?" The case is interesting from the fact that the magistrate (Mr. Mead) distinctly laid it down that in his opinion structures which come under the heading of plant, and which are erected in such a manner as to last the term of a lease of twenty-one years, are "permanent." This decision will have an important bearing on many businesses.

IN Mr. Spear's Report to the Local Government Board upon the "Sanitary Condition and Administration of the Pembroke Rural Sanitary District" it is stated that the district was visited by Dr. Airy on behalf of the Local Government Board, and in connexion with a serious outbreak of diphtheria in the village of Jamestown in 1880. In 1885, when an invasion of cholera was anticipated, the district was again inspected on behalf of the Board by Dr. Davies. On that occasion he reported that no regular means of drainage existed; that roadside gullies served as slop-water drains; that privy-pits or cesspools, often dangerously near sources of water supply, were in general use, and that many houses possessed no privy accommodation; that no public arrangements for scavenging existed; that water was chiefly derived from wells requiring protection from pollution, and that the cottages of the poor were often damp and ill-ventilated. The report proceeds to state that various recommendations have been made from time to time by the medical officer, to the local authorities, with little result; and describes the present condition of things. The old difficulty about efficient removal of refuse turns up here again. At Neyland, we read—

> "No sewers have been provided, and sewage is discharged into any convenient gutter, or is thrown on to the open spaces about the dwellings, so that practically nuisance from this cause is universal. Deep privy middens or cesspits are in general use, and there are many instances of very close proximity of these structures to the dwellings. There is no public provision for the removal of refuse, and the people have evidently great difficulty at times in securing its removal. When undertaken by a farmer or carter, the work, moreover, is not done gratuitously, *and careless tenants will allow large accumulations to take place, rather than defray the cost.*"

This is one of the worst and most frequently recurring evils in the insanitary history of country districts, and it is one in regard to which further and stricter legislation seems urgently called for.

FROM a letter of Mr. Tarver's, printed in another column, it appears that we unintentionally misrepresented his proposal for an addition to Westminster Abbey, in referring to it as approached from the Chapter House. The block plan, representing a series of small chapels radiating from the Chapter House wall, produced this impression, and in order to set Mr. Tarver right we reproduce his detailed plan and section, which we had


WESTMINSTER ABBEY.
A suggestion for extending the space for Monuments by building Chapels between the buttresses of the Chapter House.
SKY LIGHT
G STAINED GLASS MEMORIALS IN THREE SIDES
CHAPTER-HOUSE WINDOW
HOT WATER PIPES
HIGH WATER
FEET
SCHEDULE
9 STATUES — Marked — A on Plan.
4 GROUPS — B
6 BUSTS — C
5 SLABS — D
2 CENTRAL MONUMENTS — E
40 MURAL FIGURES AND TABLETS — F on Section
5 STAINED GLASS MEMORIALS — G
71 in each Chapel.
say 350 in all
LARGE WINDOW OVER
LOW ROOF OVER AMBULATORY
G WINDOW OVER
G WINDOW OVER
CHAPTER HOUSE

Mr. E. J. Tarver's Plan for adding Monumental Chapels to Westminster Abbey.

overlooked, showing the arrangement he proposes. The idea is that these chapels would form recesses for monuments in the same way as the bays in Henry VII.'s Chapel; and that the door at Poet's Corner being done away and left only as an open doorway, the chapels thus formed would be actually within the building as altered. This puts the suggestion, of course, in quite a different position from a scheme using the Chapter-house itself as an approach, and is therefore not open to the objection we raised on that score. We do not recommend it for adoption, because we hardly consider it is a sufficiently important and dignified manner of providing the space required, and it would result in putting the monuments rather too much away in a corner, and would somewhat encumber, architecturally, the exterior of the Chapter-house. But it is at all events a very ingenious suggestion, and we have pleasure in publishing it as such.

EVERY reader of the *Times* is aware of the wonderful versatility and intrepidity of the Paris correspondent of that journal. There is apparently no subject on which he does not feel called upon to enlighten the public. But, unless he be the victim of translator, telegraph clerk, or printer (or of all three combined), he had better leave engineering topics alone. His latest achievement in this line is with regard to the proposed Channel Bridge. Writing on the 26th of December (see the *Times* of the 27th) he details with great circumstantiality what he says are the latest results of the survey of the Channel, and states that M. Renaud, the hydrographic engineer, has come to the conclusion that the most advantageous line for the bridge is not that fixed on in the preliminary scheme:—

"The line he recommends is straight. It starts from a point 350 mètres north-east of the light to the west of the South Foreland, and it terminates 300 mètres north-east of the entrance of the tunnel near Cape Grisnez. Its length is 33,450 mètres. The greatest depth of water met with on the line was from 50 to 51 mètres, a depth extending only over a distance of 1,700 mètres. The length of the bridge along the line now proposed is shorter by 5,150 mètres than that suggested in the preliminary scheme. Moreover, it avoids depths of 55 mètres, and those over 50 mètres extend only over a comparatively short distance."

A little further on, he says:—

"As regards the bridge itself, the line being shortened and the height of the piles diminished in consequence of the greater shallowness of the water through which it passes, considerable diminution of expense is secured as compared with the first scheme. Instead of four millions of mètres cube of masonry there will only be three-and-a-half millions. About 50,000 *millions of tons of metal* will be saved. Lastly, there will be 92 piles instead of 112, and of these 92 piles 17 will be sunk in depths of 30 to 40 mètres, 31 in depths of 40 to 50 mètres, and the others in depths of less than 30 mètres."

The italics in the last paragraph are ours. If fifty thousand millions of tons of metal will be *saved* by adopting the shorter route, we should like to know how many "thousand millions of tons" of iron will be required for the erection of the bridge, even by the shorter route? By "piles" we presume "piers" are meant. As our readers will know, they are very different things. Fortunately for the resources of the iron-producing countries of the world, to mention no other consideration, this scheme is even less likely to be carried into execution than the Channel Tunnel.

AMONG the trials of the winter many persons count "smoky chimneys." There is scarcely a country house to be found which does not contain a room with this nuisance. But in seeking to remedy this troublesome defect, care must be taken that the remedy is not worse than the disease. The small builder at once prescribes a cowl, and as soon as it is up the householder fancies that nothing more has to be done; on the contrary, this piece of machinery must be kept in good working order. A correspondent informs us that a chimney in his house had on it a cowl, placed there, as the lawyers say, by a "predecessor in title," and that the room which it served was occasionally subject to "smoky chimney" in a mild form. One windy night the cowl blew off, and since then the disease of "smoky chimney" is unknown in that room. Another room recently took the disease badly, and on examination it was found that the cowl had set itself obstinately to face the wind. As soon as it was made to move in a normal manner, the disease left the room. Our correspondent would have done well to see that the cowl was in working order at the beginning of the winter, but the example shows that the mere receipt of a cowl to cure a smoky chimney is not sufficient.

AN article on "Bookbinding" in the *English Illustrated Magazine*, by Mr. Cobden Sanderson, is worth attention, in spite of its very self-conscious character. The examples of binding from the author's own work are beautiful, and, along with some of the remarks on the subject, serve to illustrate the manner in which the subject of a book may, in a kind of far-off symbolical fashion, suggest a character for the design of the cover. Thus the broad bands of daisies which decorate a beautifully-bound "In Memoriam" were suggested by the line in "Tithonus"—

"The grassy barrows of the happier dead"

(not from the poem in the binding, by the way); and the binding of "Atalanta in Calydon," with its flame-like growths, was suggested by the passage in the poem in which Althæa describes her dream of the firebrand. In regard to the nature of the design which is to be placed on a book-cover, we are glad to see that the author of the article speaks strongly against naturalism, and ridicules the idea that "a natural spray or flower may be tooled on the side of a book, so as to appear as if thrown down carelessly." As Mr. Cobden Sanderson justly says, it is the object of design to recast and redistribute nature, to invent something on the basis of nature, so that "it shall be an organism whose parts have symmetrical relationship one to another, on a plan of his own devising." If, instead of doing this, the artist contents himself with copying a natural spray, "he will be developing his own dissolution and the dissolution of his craft." This, and a good deal else in the article, is exceedingly true and well put. It is a pity that, while admitting this, one should have to be annoyed at the bad taste of heading the article with "a view of Mr. Cobden Sanderson's workshop," which is of no interest in itself, and certainly has no bearing on the elucidation of the subject, and which comes

oddly from a writer who in the course of the article speaks of "this advertising age." Still more extraordinary is the fashion Mr. Cobden Sanderson appears to have set up of dedicating bindings to his children, by tooling the name on the cover, so that in the middle of the cover of a Homer we are astonished to read "Richard" on a blank space of the design. It does not appear quite clearly whether this was merely on the study for the design, or whether it is actually introduced on the bookcover itself; but we are led to conclude the latter. If it is so, we do not know whether to wonder most at the bad taste of the artist who does this, or the complaisance of the client (of course we must not say "customer") who allows it.

LETTER FROM PARIS.

MUCH has been said recently about an endeavour to re-unite the two camps into which the Paris artists have become divided. The division which took place openly during the past year was, however, in reality one of long standing, and the question of the awards in the Universal Exhibition was really seized upon as a convenient pretext for secession by the artists who now make up the Salon Meissonier. But the idea of a possible re-union has at all events given additional interest to the triennial election of the Committee of Direction, the "quatre-vingt-dix," as they are called, as upon the composition of that Committee depends the question of peace or war between the two factions.

All the old members, however, have had their powers confirmed anew. The section of painting still includes MM. Bonnat, Tony Robert-Fleury, Jules Lefebvre, Benjamin Constant, Détaille, Merson, and Barrias; that is to say, the most ardent and irreconcileable opponents of the new Salon; and it is the same in the departments of sculpture and engraving: so that it is not likely that the year 1891, at all events, will see the desired reconciliation brought about. This is more especially to be regretted in regard to its influence on the funds for infirm artists, which are seriously impaired under the present state of things. Another consideration is, as M. T. Robert-Fleury has observed in a recent report, that the artistic supremacy of France is seriously threatened by the growing power of the Munich annual exhibition.

As to architecture, which in the annual Salons forms a kind of inner party of its own, taking little heed of these disputes among the other ranks of artists (in fact it has hardly any footing in the Salon Meissonier), we find it represented in the new Committee of Direction by MM. Vaudremer, Charles Garnier, Coquart, Bailly, Daumet, Pascal, Ginain, Alfred Normand, Laloue, and Loviot.

The Government also, on its part, is occupied in trying to make up the quarrel; but MM. Bailly and Bouguereau have protested against this, and M. Meissonier seems averse to any truce except on conditions almost entirely in his favour. To these feelings of hostility are added more practical difficulties. The old Salon is threatened by the Municipality, which wishes to regain possession of the Palais d'Industrie, and the Salon Meissonier is also in considerable perplexity as to the scene of its future exhibitions. The Union des Arts Décoratifs, represented by M. Antonin Proust, is urging the Municipal Council for the use of the Palais des Beaux-Arts for its exhibitions; and M. Meissonier, great painter as he is, is but a very simple-minded tactician, and has not succeeded in defending his right of priority in the matter. The probability is therefore that the Union will carry the day, and the Salon Meissonier will only obtain the galleries, if at all, at the cost of a heavy rental.

The Musée des Arts Décoratifs is in the way of prosperity in every sense. Its collection now includes not less than 3,000 pieces of gold and silversmiths' work, ceramics, sculpture, objects of ecclesiastical art, and textiles. It is therefore rather straitened in its present quarters, and M. Proust has indulged that ambition of making the Palais des Beaux-Arts a kind of "South Kensington" museum for Paris, in which the architectural treatment of each room is to be carried out in accordance with the general date and character of the collection contained in it. If he succeeds in his aim, some of the architects may therefore look to have a very interesting task to carry out.

The recent discussion of the Fine Arts budget in Parliament has served as a pretext for some sharp criticism on the management of the Louvre. The Minister of Fine Arts has characterised these criticisms as mostly trivial and uncalled for. There has been especially a dead set made at the mosaic decoration of the Escalier Daru, the demolition of which has even been demanded on the ground that it is a discredit to the art of the present day. The architectural treatment is copied from the church of St. Martin at Cologne, a piece of pure Romanesque of the eighth and ninth centuries.

We have before spoken of the decorative painting of this staircase, in which the France, Germany, and Flanders of the Renaissance are represented by figures executed from the cartoons of M. Lenepveu. The cupola is now nearly completed. The vault is completed in mosaic and the walls are veneered with marbles. The landing is reserved for the representation of modern art, and the antique will be symbolised in another portion of the decoration, in the shape of medallions containing portraits of Pheidias, Vitruvius, and other celebrated names in ancient art. The scheme, originally drawn up in 1886 by M. Guillaume, the architect, is therefore an important and very complete one, and it is to be hoped that the Chamber of Deputies will know better than to interfere with its completion.

M. Carolus Duran's ceiling painting, "The Triumph of Marie de Medicis," before referred to, has also had the misfortune to displease the Fine Arts Budget Committee, though in general it is regarded as a very successful and effective piece of work.

There is still however much to be done to complete the decoration of the Louvre, about which the director, M. Kaempfen, is very much in earnest, in spite of these Parliamentary criticisms. He has just had the idea of bringing together, in one gallery, all the works in metal which were formerly scattered about in various corners of the building, and some of which, in fact, for want of proper space and arrangement, have never been exhibited at all. He has thus formed, in a room on the first floor, a fine collection of this class of work, which will shortly be opened to the public. In a large glass case which occupies the whole of one end of the room, are arranged the statuettes, the salvers &c. of German and Venetian work, clocks and chandeliers. Among these works there is especially to be noted an "Arion" by Riccio, two figures attributed to Michelangelo, the chandelier from the Montmorency Chapel, firedogs decorated by John of Bologna, bronzes by Donatello, and some splendid examples of wrought iron work. Side by side with rare bronzes of the sixteenth and seventeenth centuries, ecclesiastical furniture, arms of various kinds, we find also the "Frileuse" of Houdon and animal subjects by Barye. The arrangement of this gallery, which has been entitled the "Salle de la Ferronerie," does the greatest credit to the taste and discernment of the curator of the Renaissance and Mediæval sculpture department.

The Cluny Museum continues to add to its collection, and has just opened a new gallery containing works of the thirteenth, fifteenth, sixteenth, and seventeenth centuries, collected during fifty years by Isaac Strauss, the former well-known composer and *chef d'orchestre*. This collection was offered to the State by the Baroness Nathaniel de Rothschild. The Guimet Museum, the interest of which is also continually increasing, has just received the whole collection of Asiatic ethnography formerly in the Trocadéro; and there is some idea of presenting to it also the objects of the same class which are now in the Musée de Marine and at Fontainebleau, and which illustrate the religious history of the extreme East.

The Municipal Council of Paris, which has deferred so far its usual purchases from the Salon, has just voted the purchase of a certain number of works of painting and sculpture which figured in the two Salons of last year. In sculpture it has selected the statue by M. Labatut representing the last moments of Cato, the "Nymphe lutinant un Dauphin" by M. Larroux, the "l'Archimède" of M. Vital Cornu, and the "L'Amour" of M. Demaille. Besides several paintings, the Council has also purchased a vase in the Renaissance style by M. Barré. This is a new step, intended to indicate that the Municipality intends for the future to recognise works of industrial art as worthy of encouragement by purchase, as well as works of painting and sculpture.

The decoration of the Pont de la Concorde has come up anew for discussion. The municipality wish to decorate it with statues of the philosophers of the eighteenth century and the great men of the Revolution. The idea is not new, as there may be seen now, in the great court at Versailles, the statues which for some time adorned the pedestals at each side of this bridge. If the scheme is carried out, the sculptors of to-day will have some fine opportunities before them, and the decoration of the Place de la Concorde will be happily connected with that of the façade of the Corps Législatif.

We have before spoken of the prize offered by M. Osiris to the architects and engineers who took part in the erection of the Galerie des Machines. The committee entrusted with the matter have decided that in addition to the prize or premium, there should be a commemorative medal to the constructors and artisans employed. M. Chaplain has been commissioned to execute the medal, which represents an artisan in ironwork seated on an anvil and leaning on his hammer; a genius places a wreath on his head. On the second plane of the medal various utensils are grouped, and as the ultimate background or "fond" is a long perspective of iron girders. It is a work which does great honour to the eminent artist who has been entrusted with it.

The Conseil Supérieur des Beaux-Arts, which met a few days ago, has unanimously voted the maintenance of the ateliers of the school. The Council is always occupied with the question of admission to the ateliers so vehemently demanded by the "Union des Femmes Peintres et Sculpteurs." Though favourable on principle to the improvement of the artistic education of women, the Council considers that it would be out of the question to admit women students to the ateliers of the Rue Bonaparte, and that they must have a distinct locality; an opinion which has already been expressed in touching on the subject in a former letter. If women are admitted to the course of the Ecole, therefore, it will be in such a way as will separate them entirely from the existing studios with their exceedingly unconventional standard of manners.

An interesting experiment in decentralisation of artistic training has just been made by a certain number of pupils of the École des Beaux-Arts who have quitted the schools to found, in the Rue Campagne Première, a free academy which is to include every year an exhibition of the works of the pupils, who will not receive either medals or other prizes. If the experiment answers the example may become contagious, and the official establishment of art instruction may suffer somewhat in consequence.

The following are the results of the last competitions in the École. For the exercises in the course of architectural history the jury have awarded medals to MM. Proy and Mercier, pupils of M. Raulin; to M. Delabarre, pupil of M. Moyaux; to MM. Du Pasquier and Garnier, pupils of M. Blondel; and to M. Friedlandel, pupil of MM. Daumet and Girault. The "prix de fin d'année" has been awarded to M. Chifflot, pupil of MM. Daumet and Girault, for the restoration of the façade of the church of the Collège de l'Arc at Dôle. The same student has obtained the "grande médaille d'émulation" for 1889-90.

In the competition in decorative composition among students in painting, sculpture, and architecture, a "troisième" medal has been awarded to M. Adolphe Lerolle, pupil of M. Peigney (architect). His brother, M. Louis Lerolle, pupil of the same architect has obtained a "seconde troisième" medal. In the "Concours de Rome" for 1891, the dates of the first and definitive competitions for the three branches of students are now published.

Several artists of talent have died during the past month, the best known among them being the painter Eugène Lami. He was born at Paris in 1800, and has therefore lived to an unusual age, retaining all his faculties and even his artistic power almost to the last, for last year he exhibited at the "Galerie des Aquarellistes." He had been a pupil of Gros and of Horace Vernet, and entered the Ecole des Beaux-Arts in 1817. He received medals at two or three different exhibitions, among others at the Universal Exhibition of 1855, and was made Officer of the Legion of Honour in 1862. After having started as a painter of historical and military pictures, he became subsequently a recognised master in

scenes of modern fashionable life. The gallery at Versailles contains several of his battle pictures. The Luxembourg contains some very fine water-colour pictures in his later style, among others one representing the fête given by Napoléon III. to Queen Victoria. His talent was much appreciated in England, which he frequently visited, and the Rothschild family possess a considerable number of his works. Lami, whose illustrations to Alfred de Musset's works, to Gil Blas, and to Manon Lescaut, are celebrated, was during his whole career a *persona grata* in the aristocratic world, and he will retain an important place in the history of French art in the nineteenth century, through the greater part of which he has lived.

The painter Théophile Gide, who is also dead, was especially a painter of religious subjects. He had studied under Paul Delaroche and Léon Cogniet. He had exhibited since 1850 and obtained various medals, and the Cross of the Legion in 1866. The museums of Angers, Amiens, Alençon and Roubaix, as well as the Luxembourg, possess examples of his work, rather hard in texture and monotonous in colour. He died at the age of sixty-eight.

The painter Emile van Marcke, who has died suddenly at Hyères at the age of sixty-three, had been a pupil of Troyon, and, like him, gave himself mainly to the representation of cattle. He painted animals and landscape with the same truth and sincerity, but always with an equable kind of excellence and with no novelty or originality. He had obtained various medals for excellence of work, and had always the esteem of other artists.

Another painter deceased during the month is Hippolyte Dubois, who had attained a certain degree of celebrity and obtained a medal in the Salon of 1866 and a bronze medal in the 1889 Exhibition. He died at the age of 59, in the Hôpital Beaujon.

Eugène Louis Charpentier, whose death has also to be recorded, was a painter of historical subjects, and battle-pieces, and studied under François Gérard and Léon Cogniet. His works are in various public museums, especially those of Lyons and Boulogne, and there is a picture of his at Versailles, representing the Duc d'Orléans before the town of Antwerp. He received a medal in the 1841 Salon, and the cross of the Legion of Honour in 1857. He was 79 at the time of his death.

We may terminate this too long obituary record by the notice of the death of a sculptor who was celebrated at one time, though little known to the present generation. This is Auguste Marie Ottin, who has died at the age of 79 at the retraite Galignani. He studied sculpture with David d'Angers, followed the course of the École des Beaux-Arts, and obtained the Prix de Rome in 1836. During his sojourn at the Villa Médicis he undertook a great many works which popularised his name rather in Italy than in France. Among the best known were his "Amour et Psyche," the "Chasseur Indien," and "Hercule au Jardin des Hesperides." There is attributed to him also the group of "Polyphême Suprenant Acis et Galathée," which adorns the Médicis fountain at the Luxembourg. A few years ago the Municipality of Paris purchased from the Salon a rather mediocre bas-relief of his, symbolising the Triumph of the Republic. He obtained a second medal in 1842, a first one in 1846, and the Cross of the Legion of Honour in 1867.

RETIREMENT OF AN OLD "READER."—One of the oldest "readers" in London has retired from the service of the Hansard Publishing Union. Mr. John Bate, who had been employed in the firms of Cox Brothers, Cox & Wyman, Wyman & Sons, and the Hansard Publishing Union, for nearly forty-two years, having recently sustained a severe bereavement, has decided to retire. Mr. Bate, for upwards of thirty years, "read" the *Builder*, under the editorship of the late George Godwin, and for some years has been the senior "reader" in the above-named establishment. He has on various occasions been thanked by the firm for the services he has rendered, both as "reader" and in other ways; and the respect in which he has been held by the employés has often been demonstrated. So long back as 1848 Mr. Bate had the "reading" of the *Law Times* and other publications belonging to the late Serjeant Cox; and numerous other works and serials have passed through his hands. We trust the firm will show their appreciation of Mr. Bate's long and faithful service in the shape of a pension, or in some other tangible way. We are sure he will be followed in his retirement with the heartiest good wishes of all who came into contact with him. —*Printing Times.*

THE WOODEN THRONE IN CANTERBURY CATHEDRAL.

ATTENTION has lately been attracted to this interesting piece of old wood-work, and it has been disinterred, from the place to which it was consigned in 1842, when it was removed from the Cathedral Choir, to make room for the present stone edifice, given by Archbishop Howley. Archbishop Tenison gave the throne in 1706 as the final step in the refitting of the choir which had commenced in 1676. Curiously enough there is no mention of the throne in the cathedral records, though all other pieces of the work, from the wainscot to the new pews, have their date and cost entered in both Dean and auditor's books. But there is no record either of the Archbishop's gift or of any vote of thanks to him for it by the Chapter, as it seems to have been considered his affair, and his only. Somner (antiquities, 1640) mentions the older throne as "the Archbishop's wooden seat or chair; sometime richly gilt, and otherwise well set forth, but now nothing specious through old age and neglect. It is a close seat made after the old fashion of such stalls, called thence Faldistoria." Dart (1727) speaks of a new throne being placed in the room of this seat, but says nothing of either donor or workman.

The authority for it being the work of Gibbons is Vertue's diary, quoted by Walpole, "Archbishop Tenison built a decent and beautiful throne in the choir of Canterbury Cathedral, the carving work done by Gibbons, the cost of the throne, 70*l.*" Gostling, writing in 1777, objects to this, and says, "In the Biographia Brittanica the expense is said to have been 244*l.* 8s. 2d., which seems more likely than only 70*l.*, at which the honourable Mr. Walpole rates it, and says the carving was by Gibbons. This, perhaps, may be doubted, as nothing here seems the work of so eminent an artist."

The remains at present consist of six Corinthian columns, and the triangularly planned cornices in which they were set, the back and sides of the seat, which are plain wainscot, and the various parts of the canopy, which rose to a considerable height above the seat, as well as the mitres and pinnacles by which it was adorned. In Nash's drawing of the choir in 1805, there is a good picture of the throne, showing that this canopy was a kind of open arch, leaving a clear space above the back of the seat, through which the pillar in the transept-wall can be seen. It was joined to the cornice above the pillars by a carved scroll, which has unfortunately disappeared, as have the five carved shields which formerly hung from the front of the canopy.

The whole canopy is exceedingly awkward and clumsy in construction, and when adorned with mitres at front and back, and pinnacles at the two sides, must have been rather grotesque than beautiful. None of the work is in Gibbons' own special style, as wreaths and festoons of foliage are conspicuous by their absence; but the pinnacles, though their bases are heavy, and somewhat bare, are finished with clusters of flowers and tall, upstanding leaves, which are wonderfully light, graceful, and free in arrangement.

In the same way there is a border of small cinquefoils at the top of the cornice, which stand out clear and lifelike in a fashion perfectly distinct from the leaves and conventional patterns of the other borders, and the acanthus leaves of the capitals have the clear, fresh cut which is one of Gibbons' characteristics. May one venture to surmise that the sculptor found the whole edifice designed, and was only able to adorn some parts of it, as the plan did not lend itself to ornament? If the main part of the erection was the work of a local and unknown man it would account for the small sum which it cost, according to Vertue, or, perhaps, Gibbons had 70*l.*, while the total cost was 244*l.* 8s. 2d.

As might be expected, the throne has suffered from forty-eight years' neglect, and when re-erected as at present contemplated, the damage will be apparent. As before said, the five pendent shields, which hung from the canopy, as well as the scrolls which joined canopy to cornice, have disappeared, though there is still a hope that the latter may be found. The triple row of carved acanthus-leaves round the capitals have in many cases lost their curling fronds (if such a term is allowable). Enough remain to show how beautifully they were cut, and how boldly they stood out from the pillar; but the high relief, which is their beauty, has also been their ruin, as in most cases a very slight knock has been enough to break them off.

Nothing has yet been settled about the place of re-erection, as of course it would be out of the question to replace the throne in the choir, whence all the wainscot of classical pattern, with the exception of the Dean and Prebend's stalls, has been removed. The Cathedral library is talked of, or possibly some place may be found for it in the Cathedral, though not in the choir. At present the various fragments are being cleaned and renovated, and the six columns are already safely housed in the Cathedral library.

Illustrations.

CANTERBURY CATHEDRAL.

IN regard to the view of Canterbury Cathedral given in this number, the first of a series of illustrations of the Cathedrals of England and Wales, a few words are necessary in the way of what in the House of Commons is called "personal explanation."

In the first place I wish it to be understood that the placing of a drawing of my own as the first in the series was quite contrary to my intentions, and only the result of peculiar circumstances. Three months ago one of the ablest and best-known architectural draughtsmen in London accepted the commission to prepare a drawing of Canterbury, but about the time when I expected to receive the drawing I received only a letter regretting that temporary ill-health had rendered it impossible for him to complete it. Another very well known artist then undertook it, though on rather short notice, and a week after he was compelled to leave England owing to the sudden death of a near relative abroad. Under these circumstances I preferred to undertake it myself rather than ask any one else to do so under the disadvantage of pressure of time.

The original drawing was prepared in pencil-line and lightly tinted in Indian-ink, a method adopted as one of the quickest that could be employed where time was short. Unfortunately the "ink-photo" process, the only one which there was time to employ, is not calculated to reproduce satisfactorily the rather delicate effect of this method. Consequently some detail is lost in the reproduction which was clear enough in the original, and "values" of tint are in other places much exaggerated. I am desirous that this drawing may be reproduced again by a different and more delicate process, in order to take its place better in what it is hoped will be a valuable series. In the meantime I must ask the candid reader to believe that some at least of the deficiencies of this illustration are inherent in the process employed, and not in the original drawing.

H. H. STATHAM.

The view here given of Canterbury Cathedral is taken from a point which is not actually accessible on the site. The south-west angle of the precinct is in fact the only one from which a general and comprehensive view of the greater portion of the building can be obtained. But for the purposes of a drawing the furthest point attainable within the precinct is too close, and includes too large an angle of vision. At the south-eastern portion of the precinct there is space enough for a comprehensive view, but the fine trees which in one sense form so great an addition to the general picturesque effect of the cathedral shut out too much for a complete architectural view, in which in any case the western towers would be reduced to a very subordinate position. The view of the central tower and part of the cathedral from the cloister on the north side is magnificent as a picture, but loses again a great deal of the architecture. Taking the south-west view therefore as the only comprehensive one, the main lines of the building have been set out from a plan, as they would appear from a point of sight some little distance beyond the precinct. The principal heights, those of the towers, the roof ridge, eaves, &c., have been in like manner set out from the heights given in Britton's Geometrical Elevations and Sections, which in regard to these principal measurements may safely be assumed to be correct. The details have then been filled in partly from sketches on the spot, so far as the recent inclemency of the weather

permitted, partly from photographs, used, of course, only as memoranda of the actual facts of detail, which could thence be drawn according to the assumed position of the spectator. Nothing in the drawing is copied from a photograph. Photographs are invaluable as memoranda, but illusive as representations, owing to their constant tendency to distort and misrepresent proportion.

It will thus be recognised that considerable pains have been taken to obtain accuracy of representation, and it is believed that the view of the cathedral here given may fairly claim that merit, so far as a building of such size and multiplicity of parts can be represented on a small drawing. For it is one of the most impressive characteristics of Canterbury Cathedral that it seems not so much a building as an assemblage of buildings. Promontory after promontory opens out as you walk round it eastward; the eastern end by itself, necessarily lost here behind the Norman transept, is a grand study of piled-up masses, and the small tower at the re-entering angle of the choir aisle and the eastern transept, seen at a distance in the drawing, contains on a near view enough of rude but powerful detail to make a picture in itself—a picture which we may be able to give on a future occasion.

The plan which we have the privilege of publishing is a very complete and painstaking one, and reflects the highest credit on the care and ability of the architect, Mr. George Smith, of Canterbury, who drew it from actual measurements a few years ago. The plan, nearly twice the size of this reproduction, now hangs in the Cathedral Library, and our readers will no doubt feel that they, along with ourselves, have reason to feel much indebted to the Cathedral authorities for permitting the publication of a plan which affords so valuable a record of the architectural history of the Cathedral.

Mr. Smith's plan, it will be seen, distinguishes the dates of various portions of the building by varieties of shading. But the mere fact that this portion is of the Norman period and that portion belongs to the thirteenth century &c., easily enough perceived from the plan, does not in itself bring out the true meaning and history of these changes. Let us endeavour in a few words to sum them up here.

The foundation of the archiepiscopal cathedral dates from the time of St. Augustine, its architectural foundation in a sense probably from before that time, since it is recorded that St. Augustine made use in the first instance of a church which had been constructed already by Roman converts to Christianity. This was enlarged subsequently in 950, but when Lanfranc, abbot of Caen, one of the strong, gifted, and energetic characters who shine out from time to time in the history of the mediæval church, was appointed Archbishop of Canterbury towards the latter part of the eleventh century, he found the ancient church in so ruinous a state that he, in 1070, pulled it down and commenced an entire rebuilding. Of the ancient church thus removed it is not probable that any fragment now exists. Having been originally built under Roman influence, it probably was of the Roman basilica type, with colonnaded aisles and an eastern apse.

Lanfranc's church extended to less than half the length of the present cathedral, the tower being in the same position as now, and the masonry of Lanfranc's crossing piers being probably now existent within the body of the crossing piers as they now appear; as is indicated on the plan. The nave probably did not extend so far west as the present one by a good deal. The western transepts were on the site of the present ones, in which also some of Lanfranc's building is incorporated. These transepts, according to the almost universal custom of the period, would have an apse on their eastern side, and the choir would have terminated eastwards in a larger apse extending perhaps 50 ft. or so east of the crossing.

Lanfranc built from necessity, as the church to which he was appointed was ruinous. But twenty years after his church was completed came another great alteration and extension arising purely out of that enthusiastic passion, at once religious and architectural, which again and again in the history of Mediæval architecture led to the sweeping away of building that was in perfectly good condition, in order to replace it by something nobler, more ambitious, and more in accordance with the advanced architectural ideas of a new generation. The work done under Lanfranc's successor Anselm, is probably that shown in black on the plan. Looking at the plan of the crossing piers, on the east side, it will be seen that Anselm, or those who worked under his suggestion, commenced by slightly widening the choir. They built a new eastern transept, and beyond it the two towers or chapels inclining inwards towards these towers, being really tangents to the large apse which completed the building eastward, and on the centre line of which was the Trinity chapel, on the site of the present one of that dedication, but which is not the original structure. This stage of the work is connected most especially with the names of the priors Ernulf and Conrad, but more especially with that of the latter, who is supposed to have been the real designer and master of works of the choir which bore his name, and which, in all its pristine glory, was the scene of the murder of Beckett, or at all events of the savage attack which was the prelude to it. But this "glorious choir," as it was called, was short-lived; it was destroyed by fire, beyond possibility of restoration, in 1174. Then came in the reign of William of Sens, who rebuilt the choir of loftier proportions than before, as it now stands. He died before his work was completed, and his successor, an English William, completed the eastern portion of the church as it now stands. And here we are in a position to appreciate the reason for that curious narrowing of the walls of the existing presbytery as we come eastward, which gives such a peculiar character to this portion of the interior. It is the influence of the older building on the later one. It was not desired to disturb or remove the two towers which had flanked the old apse, so the new choir was narrowed to get between them, and also to bring the rebuilt Trinity Chapel on the same site as the original one; a remarkable instance of the adapting power of the Mediæval builders, in turning a practical difficulty into a new source of the picturesque.

All this time the nave of Lanfranc had remained as it was, the cathedral being in the condition in which several of our cathedrals have remained, of having an Early nave and a later and more elaborate choir; the choir, the most sacred portion of the building, being always the first to be taken in hand in any scheme for improving and heightening the architectural effect of the building. But as Lanfranc had been compelled to build anew purely on account of the ruinous state of the church as he found it, so in turn his own nave was found at the close of the fourteenth century to be so dilapidated that rebuilding became a necessity. As far as the exterior is concerned this is probably to be regretted, for the rather weak Gothic of the present nave is not of great architectural interest; but the lofty interior with its fine vault is far superior to anything that could have been done in Lanfranc's time; partly of course on account of its very height, for Lanfranc's nave must have been much lower. The latter appears to have been demolished about 1378, but the rebuilding was not commenced for some years later. The great central tower belongs to the same architectural movement, so to speak, though it was probably not completed till a good deal after the completion of the nave. The piers were thickened and strengthened very materially to carry the tower. The central tower now stands as it was left, or nearly so, the ravages of time and weather alone having affected its appearance, by no means for the worse as far as picturesque effect is concerned. The western towers were recased, the northern one to a great extent rebuilt, in the earlier part of the present century. To some extent this is perhaps a gain to the general effect, for their smooth and finished appearance gives by contrast a greater effect to the rugged weather-beaten grandeur of the central tower, which is remarkably bold in detail for the time at which it was erected, and specially remarkable for the fine and effective treatment of the angles, with the series of strongly-marked vertical lines formed by the radiating buttresses or rather (if one may use the word of a Gothic building) pilasters, for that word more correctly represents their function, which is purely architectural and not constructive. The plan of this angle is unusual, and as far as can be judged by the eye appears to be a portion of a hexagon, the buttresses radiating from the centre. The buttress next the face of the tower joins the wall-plane at an acute angle, giving a sharply-defined shadow, as shown on the southern face of the tower in the drawing. The restorers of the western towers seem to have had the fancy, so common in Italy as to be almost a characteristic of Italian towers, of leaving all the putlog holes unfilled, a circumstance which adds a certain amount of character to them.

Looking at the view once more, we see these restored towers nearest to us, and the nave with two or three of the buttresses refaced, making a strong contrast with the rugged state of those that have not been so treated. Beyond is the western transept on the foundation-lines of Lanfranc's transept, but transformed into a piece of Late Gothic, and beyond that the plain unadorned mass of the eastern transept of the time of Anselm (probably) with its curious and rather foreign-looking tower or campanile.

VIEW IN WESTMINSTER CLOISTERS.

THIS is one of the most interesting and effective bits of architectural scenery in London, and one which we have long entertained the wish to publish an illustration of. The east walk of Westminster cloisters is in itself a very interesting bit of architecture, peculiar from the varied size and proportion of the openings. Above this peers the upper portion of the Victoria Tower, as we have many times watched it from the west walk of the cloister, putting on different aspects according to the state of the atmosphere; sometimes glittering in the sunshine, all over points of light, sometimes a mere silhouette in the misty air.

In desiring to place on record this incident in London architecture, we could not have done better than to secure the assistance of an artist who, like Mr. Herbert Marshall, has made a reputation out of his paintings of London scenery, but who has never yet painted this particular view. Mr. Marshall's drawing, made especially for this number of the *Builder*, has the merit of extreme fidelity as well as of powerful artistic effect. Taken as the sketch was in winter weather, Mr. Marshall has naturally adopted the less brilliant aspect of the tower, giving the architectural features only in the broad and suggestive way in which they are seen under the conditions of weather which have recently prevailed.

THE ROYAL ENGLISH OPERA-HOUSE, SHAFTESBURY-AVENUE.

THE above title for this theatre was only decided on and published since the printing of our illustration, which therefore only appears on the plate by the title by which it has hitherto generally been referred to as "Mr. d'Oyly Carte's New Theatre."

As the exterior design alone is by Mr. Collcutt, who is not responsible for the plan and arrangement of the building, this is given simply as a piece of architectural design. Details concerning the theatre itself will be given when it is opened.

The system of engaging an architect to design an exterior for a building which he has not planned is not a good one, but in this case at all events it has probably saved the exterior from commonplace, and enabled us to congratulate Mr. Collcutt on having produced the only piece of picturesque theatre architecture which London can boast of.

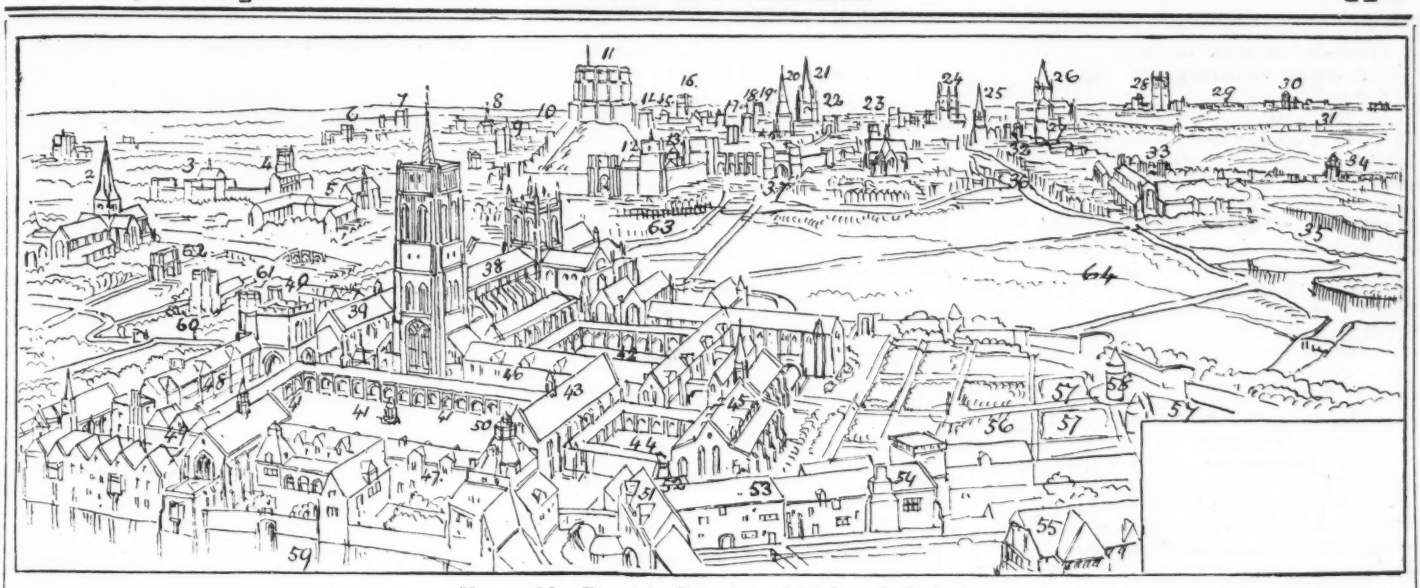
THE GREAT HALL, VICTORIA COURTS.

THIS hall forms the principal approach to the courts, and will serve as a general waiting-hall for them, all the police-courts opening direct from it by the doors shown in the view, the assize-courts being approached through the central archway, leading to an inner waiting-hall of smaller dimensions, thus securing greater quiet for them.

The dimensions of the great hall are 80 ft. by 40 ft., with 10 ft. corridors at either end, increasing the length to 100 ft.; the height from the floor to plate is 40 ft., and to ridge 72 ft.

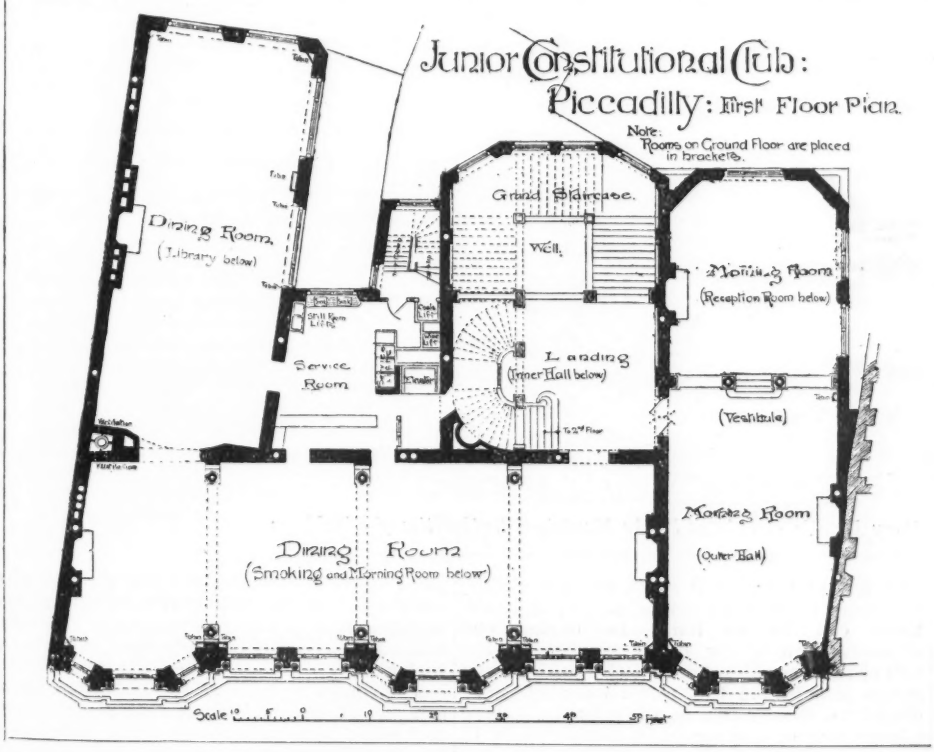
The hall is lighted by a range of five windows on the south side and one on the north, and two large end windows of fifteen lights each. The whole of these have been filled with stained glass as the Jubilee memorial of the city of Birmingham, and have been executed by Messrs. Heaton, Butler, & Bayne, from the designs of Mr. W. H. Lonsdale, the cartoons being drawn by Mr. P. H. Newman.

The walls are faced with Messrs. Gibbs & Canning's buff terra-cotta of most excellent



Key to Mr. Brewer's Drawing of Mediæval Oxford.

1. St. Giles Church.
2. Rewley Abbey (Cistercians).
3. Beaumont Palace.
4. Carmelite Church.
5. Gloucester College (Worcester).
6. St. Bernard's College (St. John's).
7. Holy Cross Church.
8. Augustinians (Wadham).
9. St. Mary Magdalene's Church.
10. Durham College (Trinity).
11. Castle.
12. St. George's College.
13. St. George's Church.
14. St. Michael's, Northgate.
15. Our Lady's Chapel, Smithsgate.
16. New College.
17. St. Peter Le Bailey.
18. St. Martin (Carfax).
19. St. Peter-in-the-East.
20. All Saints' Church.
21. St. Mary's Church.
22. All Souls' College.
23. St. Ebb's and Franciscan Monastery.
24. Merton.
25. St. Aldate's.
26. St. Frideswide's (Christchurch).
27. St. Michael's South Gate.
28. Magdalene College.
29. Magdalene Bridge.
30. St. Clement's Church.
31. Millham Causeway and Bridge.
32. South Gate and Tower Hill.
33. Blackfriars (Dominicans).
34. Grandpont.
35. Preachers' Pool,
36. Trill Mill Stream.
37. West Gate.
38. Osney Abbey Church.
39. "Domus Dei."
40. The Great Gate.
41. The Great Cloister, "Ambitus Laicorum."
42. The South Cloister, "Ambitus Sacerdotum."
43. Refectory.
44. Infirmary Cloister.
45. Infirmary and Chapel.
46. Lay Brothers' Dormitory. (?)
47. Men's Guest House, "Diversorium Virorum." (?)
48. Women's Guest House, "Diversorium Feminarum."
49. Abbot's Palace and Guest Hall.
50. Great Kitchen.
51. The Mill.
52. The "Kyll" (Maltbouse).
53. The "Canon's Building."
54. The Bake-house.
55. Tannery.
56. Gardens.
57. Fish Ponds. (?)
58. Dove-cots. (?)
59. Mill-stream.
60. St. Thomas (St. Nicholas).
61. The Hamel.
62. Rewley Gate.
63. King's Mead.
64. South Osney Isle.



quality, and the modelling is by Mr. Aumonier, assisted by Mr. Townroe. The roof is of hammer-beam construction in deal and pitch-pine, left plain from the tool.

The general contractor is Mr. John Bowen, of Birmingham, Mr. Richards acting as clerk of the works. The architects are Mr. Aston Webb and Mr. E. Ingress Bell.

JUNIOR CONSTITUTIONAL CLUB.

OUR illustration of this building, now in course of erection in Piccadilly, is taken from the original first sketch. The design, as worked out, will slightly differ in general treatment.

The new Club-house will be faced with white Norwegian marble, from Mr. Anker's quarries at Ofoten Fjord, with Portland stone for general moulded work. The three-quarter columns on the ground floor will be in Shap granite, and the entrance and shafts to first and second floor windows in red Ross of Mull granite. Fireproof floors will be used throughout. The general contractors are Messrs. Bywater & Co. Messrs. Burke & Co. are doing the stone and marble work, and Messrs. Homan & Rodgers the iron-work and fireproof floors.

The new building will be fitted with all modern conveniences; elevators to every floor. The rooms are large and lofty. Marble will be freely used in the decoration of outer and inner halls and grand staircase. Some sixty bedrooms will be provided for the use of members, who now number over 4,000. The cost of the building alone will be about 75,000*l.*, and it is hoped that it will be completed for opening by July, 1892. The club is at present occupying temporary premises at 14, Regent-street.

The architect is Mr. R. W. Edis. The building will be one of the first examples of marble being used to any large extent in ashlar facing for a London building. The necessity of providing three floors of bedrooms for members compelled the smaller treatment of the windows on these floors. One feature of the club will be a large smoking-room on the ground floor; an accommodation which in a club is generally relegated to the upper floors.

We give a plan of the first floor, with indications as to the functions of the corresponding rooms on the ground floor.

The architecture, as is not unfitting, shows a considerable family resemblance to that of the Constitutional Club in Northumberland-avenue by the same architect.

MEDIÆVAL OXFORD.

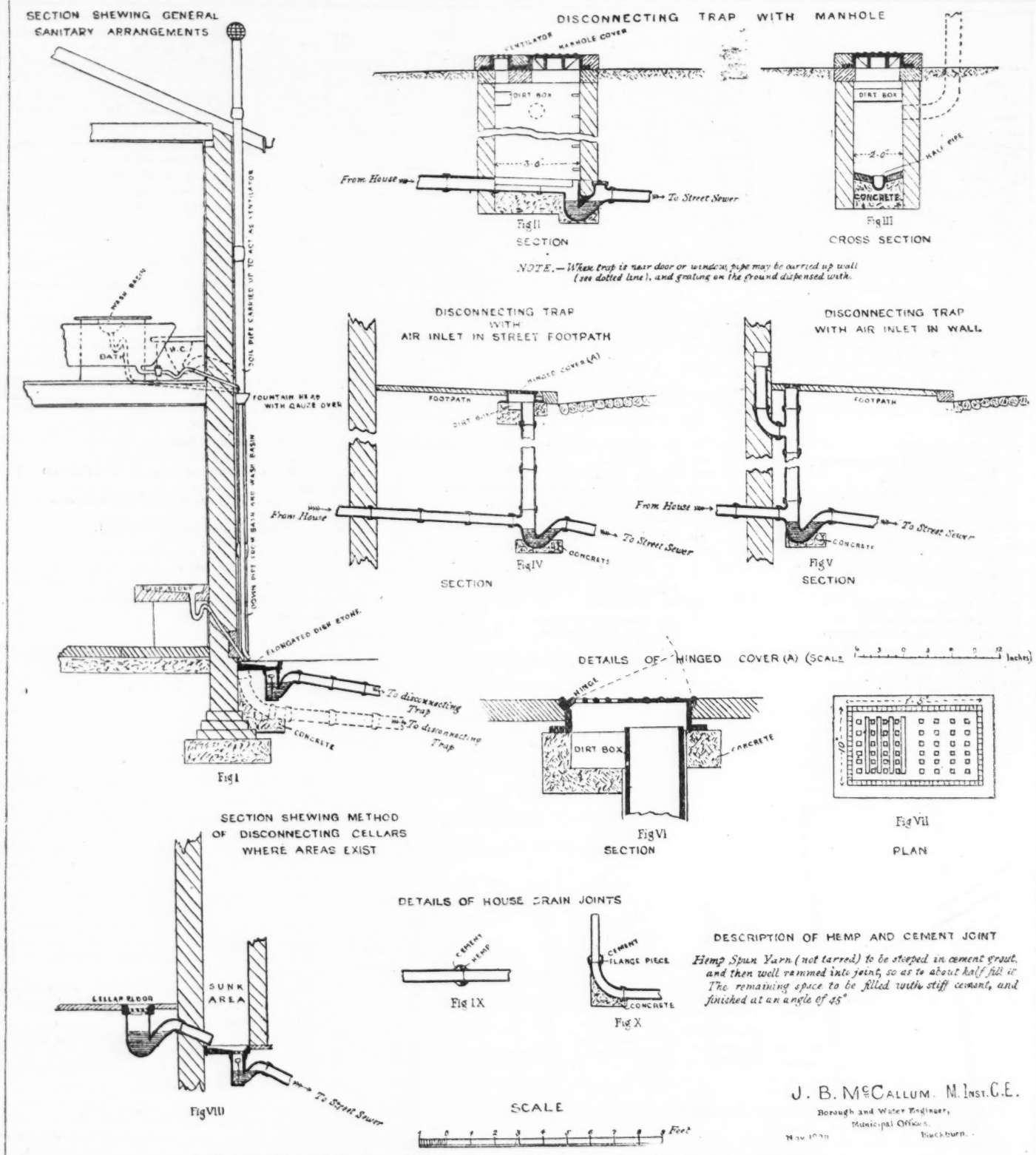
FOR a description of the buildings shown on Mr. Brewer's large drawing see key given above, and the long article commencing on p. 2.

COMPETITIONS.

TOXTETH-PARK NEW HOSPITAL.—At a meeting of the Toxteth Board of Guardians on the 24th ult., it was resolved by nine votes to three (the Chairman being amongst the three dissenting) to appoint Messrs. C. O. Ellison & Son, Liverpool, as architects for the new buildings.

SCHOOLS, COTTINGHAM.—The School Board of Cottingham, East Yorkshire, recently invited designs for an elementary school for 750 children. The design submitted by Messrs. Botterill, Son, & Bilson, of Hull, has been selected, and will be carried out. The second premium was awarded to Mr. E. W. Farebrother, of Grimsby.

PONTYPOOL ARCADE, &C.—The Hanbury Assembly Rooms Company, Limited, having obtained designs for an arcade and assembly-rooms to be erected on sites between Georges-street and Osborne-road, Pontypool, at a general meeting of the subscribers held at the Local Board offices on December 31, the plans submitted by Mr. E. A. Lansdowne, architect, of Newport, were, we are informed, unanimously selected, and tenders for the erection of the buildings will be forthwith obtained.



Pattern Sheet of Sanitary Details, circulated by the Municipal Authorities of Blackburn.

SHEET OF SANITARY DETAILS, BLACKBURN.

THE accompanying sheet of sections and descriptions of various points in the drainage details of a city is from a tracing of a coloured sheet, issued under the direction of Mr. J. B. M'Callum, the Borough Engineer of Blackburn, as a guide to builders and others in regard to the manner in which such work is expected to be done. We publish a reduced copy of it, to call attention to a very practical method of spreading instruction on such points.

SOME ERRONEOUS APPLIANCES FOR WARMING HOUSES.

ALTHOUGH it is readily admitted that "where there is smoke there is fire," yet the converse of the proposition, that "where there is fire there is smoke," is not so usually allowed. That this is true, may be seen from the appliances which at this season are recommended for warming houses, and which are actually sold for this purpose. It seems to be held that because the smoke, or rather the products of combustion, of a gas or paraffin-oil stove are not visible, therefore, there is no smoke at all; and that there can be no harm in having one of these burning for hours together in the hall or staircase of a house. The want of any means of warming this part no doubt greatly diminishes the comfort of the house by leaving a large body of cold air in its centre ready to enter any of the rooms the moment a door is opened. Nevertheless, this great evil should not be remedied by the use of one of these portable gas or oil stoves, unless they can be connected with a pipe or flue to take away to the outside air all the products of combustion. If this escape is not provided it leads to the accumulation of carbonic acid and other gases in the atmosphere of the house to a very unwholesome extent.

To understand this more fully we may put before our readers a few facts about two of these heating appliances which we have lately seen on sale. One of these is a gas-stove, and the other is a frame of hot-water pipes heated by a small paraffin-oil stove. The former of these is neatly constructed, and is apparently intended to convey the idea that nothing is given out by it which can foul the air of the place where it is burnt, and this was the view maintained by the salesman who was recommending the appliance to a purchaser. This stove is nothing but a large argand burner, surmounted with a short double chimney, the top of which has openings in it to allow the heated air to escape. It looks a simple, neat arrangement, and when burning appears fairly efficacious. These appearances, however, are altogether deceptive. This stove consumes, we were told, 8 cubic feet of gas in an hour; and this amount of gas, when consumed, yields $5\frac{1}{2}$ cubic feet of carbonic acid gas. Suppose that this stove is in use for ten hours, no less than 55 cubic feet of carbonic acid would be thrown into the atmosphere of the hall and staircase of the house where the stove was in use. Such an amount of this deleterious gas would far exceed the limits of safety. The researches of Messrs. Carnelly, Haldane, and Anderson have made it clear that the carbonic acid in the air of an inhabited room should not exceed ten parts volume in 10,000 volumes, and even in the lofty rooms of a public school, inhabited for only a portion of the day, the air ought never to contain more than 13 volumes of carbonic acid *per* 10,000 volumes of air In the more open parts

of London the normal air does not contain less than 3 or 4 volumes of carbonic acid *per* 10,000. Let us assume that this was the composition of the air in a fairly-well ventilated house; and that 2,000 cubic feet was the amount of air in its hall, staircases, and landings. This figure gives approximately the cubic capacity of the hall, &c., of a medium-sized dwelling house.

Now, if we bring into use a gas-stove like that described above, it will add 5½ cubic feet of carbonic acid per hour to the 2,000 cubic feet of air; so that at the end of one hour the proportion of the carbonic acid would be 27½ for every 10,000,—an amount which is more than double the extremest limit allowable; and this large proportion would be increased every hour the stove was kept burning.

It may be urged that ventilation would prevent this great accumulation of the foul gas. No doubt it would, but it would also allow cold air to enter, and that which had been warmed to escape, thus neutralising the very purpose for which the stove is used.

In the case of the other warming apparatus in which the paraffin-oil stove heats a frame of hot-water pipes, it is hard to see what the use of the latter is, for they only help the warming of the air by distributing the heat a little; they do not lessen the amount of carbonic acid given out by the oil stove. The amount of paraffin-oil reported to be consumed in one form of stove offered for sale was nearly ¼ gallon in a day of ten hours. By calculation, it appears that this consumption would result in the production of 6·88 cubic feet of carbonic acid per hour, giving nearly 69 cubic feet for the day: a much larger quantity than in the case of the gas-stove.

It should not be forgotten that not only do such stoves foul the air by adding a dangerous gas to it, but they also withdraw the oxygen from the air and make it less fitted for the purpose of respiration.

There are many appliances for warming houses which are quite harmless, and which are more or less efficient. It is not our present purpose to speak of them, but only to call attention to the forms mentioned, which, in the way they are offered for sale, are really dangerous. It is but right, however, to say that the simple addition of a chimney or flue, by which the products of combustion of either the oil or the gas could be carried into the open air, would render them both suitable and safe.

THE ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.

THE following is the Report of the Council of this Institute for the past year, adopted at the annual general meeting on the 13th ult., as mentioned by us last week:—

"As you are no doubt aware, at this our annual meeting we close our session, wind up accounts, and give a brief report of our doings during our term of office now closing. We venture to hope that the work we have accomplished during that period may meet with your approbation. If it be objected that but little has been accomplished by your Council, we can only say what we have often said before, namely, that we are at all times both anxious and willing to take cognisance of any matter affecting the welfare of the profession that may be brought before us, while we regard the fact of no business of a startling nature having been done as in itself a subject for congratulation, showing as it does that the course of our practice is running smoothly, and that the members of the profession have had no special need of our services.

As you may have observed from the voting-papers, we held twelve Council meetings during the past session—nine ordinary, and three special. The By-laws provide for calling a special general meeting at any time during the session on a requisition in writing from three members. No such requisition having been received, we are entitled to conclude that no such meeting was considered necessary. The Council, however, wish it to be distinctly understood that, no matter how comparatively unimportant the occasion may be, it would be to our mutual advantage to meet and discuss any question at issue if it affects the interests of the profession in the slightest degree.

In accordance with the resolution passed at our last annual meeting, a deputation of the Institute presented an address of welcome to the present Viceroy on his accession to office, and at the same time requested him to become our Vice-Patron, as his predecessors had been. He was graciously pleased to accede to our request, and also referred in eulogistic terms to the architectural features of Dublin and our ancient monuments.

Probably the most important matter which your Council have had to consider during the past session was the new Corporation Bill, especially with regard to its bearings on future building operations in Dublin. While viewing the Bill on the whole with favour, your Council considered that clauses 36 and 40 required revision; and, having had legal advice on the matter, they drew up certain amendments, copies of which were forwarded to the members of the Corporation more particularly connected with the building trades. They also commissioned your President to attend the committee meetings at the Mansion House, and explain our views on the clauses in question. The Bill has since become law, so that we can now see for ourselves the results of our action. We cannot too often seek to impress upon you the necessity of united action in these matters, so that our Institute may speak with due weight and authority.

The next matter of interest that came before us was the revival of the Architects and Engineers Bill. After giving it due consideration, and having ascertained the views of the British Institute on the subject, we determined to oppose the Bill in Parliament, on the ground that the system of examinations now being established by the last-named body will in due time place the profession on a sound basis and prepare the way for a better-matured measure of legislation than this crude and inopportune Bill can be considered to be. At the same time, we fully recognise the necessity of some radical alteration on the present system in the near future. We have some knowledge of the almost ludicrous abuse of the term 'architect' in some of our country towns. Incidents are not wanting in the working of recent Acts of Parliament where even small farmers have posed before their native unions under the style of 'architect.'

We have had further the satisfaction for the first occasion in taking united action in our opposition to this Bill with the British Institute, and the provincial societies as an affiliated body with them. Our petition was kindly presented to the House of Commons by Mr. William Johnston, M.P.

In the month of June your Council endeavoured to organise an excursion to the Rock of Cashel and other places of architectural interest in that district. Circulars giving particulars were sent out, but we regret to say that the responses to them were not sufficient to warrant us in undertaking the excursion, which had therefore to be abandoned.

We have had before us a form of contract and general conditions submitted for the approval of the Institute by the National Association of Master Builders of Great Britain. Your Council feel that this important subject is worthy of their most careful consideration, and they have opened communications with both the last-named body and the British Institute, and are at present awaiting their replies. When we shall have formulated our views, we shall take an early opportunity of explaining them to you, so that as far as possible we may adopt similar forms in our specifications and contracts.

The notice of a preliminary and intermediate examination was advertised to be held here in November last, in the same manner as in 1889. Only one candidate, Mr. Crean, offered himself, and we are glad to inform you he was allowed his examination.

Some time back Mr. A. Hill, of Cork, invited our co-operation towards the establishment of a training college for architects, with a university degree. We consider this to be a matter more properly to be ventilated and discussed by a general meeting, and we therefore bring it under your notice now. Mr. Hill's first letter has been mislaid, but we have another from him dated September 5.

Now, gentlemen, it is for you to say if you wish us to take any action in this direction or not. You may be assured that in these days of rapid progress and keen competition, it behoves us to lose no opportunity of securing for our younger members all possible educational advantages, so that the profession in Ireland may keep pace with the times, and worthily fulfil its high mission as an important factor of our civilisation."

The following is the Treasurer's Report:—

"Your Hon. Treasurer begs to state that all dividends and subscriptions have been received, with exception of those of twelve members. All accounts have been squared up and audited, as shown by the books now before you, leaving a balance to credit of 42*l.* 16s. 11d., which includes 10s. 6d. paid since. Your investments in the 2½ per cent. annuities now stand at 334*l.* 14s. 7d., in the names of the trustees. The total number of members at present is sixty-four (including defaulters), of whom thirty-eight reside in Dublin, and twenty-six in the provinces. Of the total number thirty-five are Fellows, and four are life members."

THE PROPOSED INTERNATIONAL EXHIBITION AT CHICAGO IN 1893.

AT the meeting of the Society of Arts, on the 3rd ult., Mr. James Dredge read a paper on this subject. He said that the suggestion that a great International Exhibition should be held in the United States two years hence appears to date from the summer of 1889, when the rumour spread that Americans, incited by the brilliant results achieved in Paris, determined that a similar celebration, but one that should surpass in extent and grandeur the Centennial Exhibition of the French Republic, should be held on the other side of the Atlantic.

What was only a vague rumour floating over the Champs de Mars in 1889 speedily took serious shape, and there can be no doubt that such a scheme is an eminently practical and useful one. Sixteen or seventeen years will have passed since the great Centennial Exhibition had been held in America; and this long period has been marked by a development of resources, a growth of population, an increase in industry and in riches to which history can offer no parallel. In the United States, the Philadelphia Exhibition of 1876 already belongs to ancient history, but it is regarded as an epoch from which is dated the commencement of much that was new and good in American taste and culture, notably, as regards house architecture and art publications. The great flood of annual travel from America to Europe had not then set in, and to most of the visitors to Fairmount-park, where the Exhibition was held, the contributions from foreign nations were a revelation. Since that time, of course, increased wealth and facilities for travelling have brought an ever-growing crowd of visitors to Europe; and the lessons first taught at Philadelphia have been extended year by year, until the adaptive character of the American has assimilated, more and more, European habits and refinements, and the gulf that separated our manners and customs from theirs is growing narrower day by day.

In the United States, decisive action usually follows with great promptness ideas which are favourably received; in October of 1889 it was determined definitely, and almost unanimously, that the Columbian Exhibition should be held, and with this determination came the burning question: To what city should be awarded the honour and the responsibility? The claims of New York, of course, stood paramount, partly because to New York was due the credit of the original proposition, but chiefly for the reason that New York is the metropolis of the United States, the most cosmopolitan city in the world, and the one best known to Englishmen. Situated on the sea, with a harbour that allows the largest ships to moor alongside her wharves, the facility her position offers to visitors, as well as to the goods sent by exhibitors, are unquestionably very great. To the city of New York, indeed, it seemed as though no other town could successfully contest her fitness or her right to the Exhibition of 1892; but American rival cities are enterprising and presumptuous, and several others advanced claims more or less reasonably and stoutly maintained. Washington and Philadelphia, St. Louis, Cincinnati, and Chicago, all entered the lists. Only one serious opponent remained, however, to New York after the first encounter; Philadelphia, who had snatched the honours of the Centennial Exhibition of 1876, could not expect a repetition of the same good fortune, which would have stamped her as the exhibition city of the United States; Washington, beautiful and attractive as she is, is wholly given up to political instead of commercial enterprise, and made no serious effort to gain a privilege that

was thrust upon her rather than sought; St. Louis was too remote, and Cincinnati not large enough for such a responsibility, so in a very short time it became evident that the selection lay between Chicago, a thousand miles inland, and New York. Before matters had been settled thus far, the approval of the Senate and the President had constituted the Columbian Exhibition as an enterprise endorsed and assisted by Government, so that from the beginning its official character was clearly defined. As much to the surprise as to the indignation of New York, the city of Chicago maintained its claim.

With characteristic enterprise, its citizens had, before the fray commenced, organised a corporation with a large capital. Not that it was intended to degrade the scheme by making it a commercial speculation, but because it was recognised from the commencement that the greater part of the capital necessary for carrying out this enterprise successfully must be raised in the city. Immediately after this had been done, delegates were sent to Paris to confer with M. Berger, and other directors of the French Exhibition then closed, to obtain all such information as would be useful in carrying on the conflict about to commence, and to organise the Exhibition afterwards.

One of the delegates was Mr. E. T. Jeffrey, and the other Mr. O. Chanute, a well-known American engineer. The report prepared by these gentlemen, during their visit to Europe, was very long and exhaustive, and it proved of considerable service in the struggle that afterwards took place at Washington. Of this struggle it need only be said that it was protracted and severe; New York and Chicago were practically the only claimants in the field, and much oratory and cunning argument were put forth on both sides. Probably New York committed the dangerous error of underrating its opponent; and certainly it had the fatal misfortune of suffering from political internal feuds which of itself was sufficient reason for its losing the contest. In the end, Chicago came out signally victorious; and, on April 25 of the past year, an Act of Congress was approved, providing for the celebration of the "Four Hundredth Anniversary of the Discovery of America by Christopher Columbus, by holding an International Exhibition of Arts, Industries, Manufactures, and the products of the soil, mine, and sea, in the city of Chicago." This legislation, while it constituted the Columbian Exhibition a Government undertaking, pledged the United States Treasury to but little expenditure, although there is but slight reason to doubt that, should the necessity arise, patriotic feeling at Washington, combined with the senatorial pressure from the Western States, would assure a liberal amount of Government aid.

To such an extent is the Exhibition regarded as a Government undertaking, that the Act of Congress above referred to provides that the general control shall be vested in a United States Commission, composed of two Commissioners from each State and territory, and of eight special members; this body is recognised as the Columbian World's Fair Commission. As a matter of fact, this Commission was appointed in duplicate, so that a reserve force should always be on hand to fill up vacancies. The chief functions of this Commission were to decide upon the site available for the Exhibition; to approve of the buildings and general arrangements; to make allotments of space, to classify exhibits; to determine the plan and scope of the undertaking; to appoint the juries and confirm awards; and to make all arrangements with foreign exhibitors. The actual carrying out of details, and, in fact, the responsibility of the undertaking, falls, however, upon the Executive Committee, which has been formed from the original organization of Chicago citizens, the Washington Commission being instructed to withhold their assent to any actual steps being taken until the corporation could show that it possessed a *bonâ-fide* subscription of at least 5,000,000 dols., of which 10 per cent. was paid up, and a further guarantee of 5,000,000 dols. making in all 10,000,000 dols., to provide for the expenses of construction and management. So soon as formal notification to this effect has been given by the Commission to the President of the United States, he will make proclamation of the fact, and will communicate with the diplomatic representatives of foreign nations, and through them invite their respective Governments to take part officially in the Exhibition. As regards the active participation of the Government as an exhibitor, it is provided that a sum of 500,000 dols. should be devoted to the erection of a Government building, to be filled with Government exhibits, which would be collectively contributed from various executive departments; such as the Smithsonian Institution, the United States Fish Commission, and the National Museum; the control of this collection being vested in a special committee. Another Government exhibit will be the complete reproduction of a first-class life-saving station, of which there are many on the American coast. The President is also empowered under the Act to hold a grand naval review in New York Harbour in April, 1893, and in which the navies of foreign nations will be invited to participate. Besides the foregoing, the American Government makes itself responsible for various other sums, the total authorised outlay being 1,500,000 dols.

The Corporation, acting under the general control of the United States Commission, consists of a board of forty-five directors, all of them carefully selected with reference to their influence and standing; of these the president is Mr. Lyman J. Gage, one of the leading bankers in Chicago, and the secretary is Mr. Benjamin Butterworth, who is well and favourably known in political circles at Washington. The director-general, elected only a few weeks since, is Mr. George R. Davis. Out of the body of directors a number of committees were formed; the Executive Committee with thirteen members, and others dealing with finance, grounds and buildings, legislation, national and State exhibits, foreign exhibits, catalogues and printing, transportation, fine arts, mechanical and electrical appliances, and ways and means.

The President of the United States has not yet issued the invitations of participation to foreign countries, because the financial conditions prescribed by the Act of Congress have only been very recently complied with, but it is expected that they will be delivered within a few weeks. . . . .

A struggle scarcely less severe than that at Washington followed the victory scored by Chicago, and took place within the city itself. This was the battle of the sites, in which all citizens, and many who were not interested at all, took part with that energy and vehemence so surprising to an Englishman. Railway Companies and Park Commissioners, the Government Committee, and the local executive, even the United States Engineer Corps, took active sides in the dispute, while the Chicago newspapers, with but little patriotism and less reason, added to the confusion by indiscriminate condemnation. Of course, order was evolved out of all this chaos, but not until much valuable time was lost, and more or less mischief done. One of the most lively causes of dispute was the so-called dual site that involved the arrangement of the Exhibition in two localities about three miles apart. Without explanation, this proposal appeared an unpractical one, though in reality it was attended with many advantages, and was in the end very willingly adopted. . . . .

The system of classification has not, of course, been decided on, though it has received very careful attention by the executive. Generally, it is intended that a decimal system of arrangement should be adopted, in which the groups should be divided into ten divisions, and each division into ten classes. It is proposed that the arrangement of groups should be as follows:—(1) Agriculture and allied industries; (2) mines and metallurgy; (3) marine and fishery; (4) manufactures and other elaborative industries. This group would include machinery of all classes, the applications of electricity, industrial chemistry, pottery, glass, metal-working, furs and leather, textile industries, paper manufacture, &c. Group 5 would be devoted to food and its accessories, including the production from raw materials, preparation, and preservation. Group 6, "The house and its accessories, costume, and personal equipment," embraces the arrangement, heating, lighting, ventilation, and water supply of cities; architecture, furniture, dress, jewellery, &c. Group 6 is devoted to the pictorial, plastic, and decorative arts; and Group 8 to social relations and public welfare. The last-named group includes music and musical instruments, medicine and surgery, hospitals and charitable institutions; exhibits relating to property and commerce, labour federations, and the art of war. Group 9 is that of science, religion, and human achievement. In this group would be included scientific instruments of all classes, publications, all sorts of ecclesiastical exhibits, and that special branch of educational work of which we know but little in this country, but which is such an important addition to all American churches. Group 10 is devoted to monographic and collective exhibits, a group which the executive appear desirous of encouraging, and of granting to special industries the privilege of taking their exhibits from the groups to which they properly belong, and arranging them separately in different parts of the main buildings or in independent pavilions. . . . .

As regards the Art Section of the Exhibition, two distinct questions would arise; the first having reference to an art collection worthy of this country, and consisting chiefly of pictures lent for the occasion. Such a course was followed at the Philadelphia Exhibition of 1876 with very satisfactory results; it is obvious that this class of collective exhibit has no reference whatever to commerce, and can only be carried out at a very heavy cost, which may be justified by the desirability of maintaining the credit of British art abroad. The other class of art exhibits has a more commercial object; there are many painters of excellence in this country who find it difficult to obtain and keep so large a number of clients as they desire, and these would undoubtedly find new purchasers in America, in spite of the heavy tariffs imposed on paintings. Such an exhibit certainly may not be a representative one, but it would doubtless have the advantage of bringing to many struggling artists in this country a rich and liberal *clientèle*.

Whatever objections there might be to the creation of a British section in the Chicago Exhibition, there cannot possibly be two opinions about the advantages which would accrue to visitors from this country. Comparatively few Englishmen have any idea of the wealth and resources of the United States; of the progress and culture of its people in remote regions; of the part which America is destined to take in the near future in the civilisation and commerce of the world.

PERIODICALS.

THE January number of the *Antiquary* is an unusually interesting one. It includes a review of Greek archæology in 1890, by Professor Halbherr; an illustrated article on "The Lake Dwellings of Europe"; one by Mr. St. John Hope on the "Mace of the House of Commons," with an engraving; and the first of a proposed series of articles, to be continued at intervals, entitled "Notes on Roman Britain," by Mr. F. Haverfield.——The January number of the *Art Journal* gives an etching by Mr. T. C. Farrer from Mr. Boughton's painting "Winter in Brabant," and includes an article by Mr. Sidney Colvin on "The Longford Pictures at the National Gallery," and one by Mr. Anderson Graham on the scenes of "Lord Tennyson's Childhood," with illustrations.——The *English Illustrated Magazine* contains an illustrated article by Mr. Cobden-Sanderson on "Bookbinding," to which further reference is made in another column.——*The Bookworm* is interesting to architects and archæologists for an old illustration of "The Swan Theatre in 1596," reproduced from a sketch by Johannes de Witt, who visited England in that year. The sketch was discovered in the University Library at Utrecht. It represents, in a rude way, a wooden theatre with tiers of seats round, the centre open to the sky, and a platform or huge table in the middle on which the performers acted. What appears to be the most select portion of the auditorium has a roof projecting partly over the platform, and supported by two pillars planted on it, reminding one of the two pillars of the Philistine Theatre by the removal of which Samson pulled down the roof on the nobles—

"The vulgar only 'scaped who stood without,"

as Milton puts it.——*The Field Club*, a small magazine of natural history jottings, good of its kind, has been sent to us; there is nothing in it, however, directly bearing on our class of subjects.——*Cassell's Magazine* for January (Cassell & Co., Ltd.) contains an interesting article on "The Coming Census,' and how it will be taken. Among the other contents of

the number may be mentioned an illustrated article entitled "Memories of Milan."——*The Leisure Hour* for January (London: 56, Paternoster-row) contains a chapter of the Rev. Canon Creighton's interesting "Story of the English Shires," Huntingdon being the county treated of in this number. Among other articles worth reading are "Every-day Life on the Railroad," by W. J. Gordon, and "Yankee Dodges" for saving time and labour in business, by W. E. Buck.——*The Sunday at Home* (published at the same office) includes amongst its varied contents an illustrated article on Canterbury, by W. J. Gordon, the fourth of Professor Sayce's articles on "Social Life among the Assyrians and Babylonians;" and an article by Ellen E. Guthrie on "Inscriptions on Old Edinburgh Houses."——The *Boy's Own Paper* and the *Girl's Own Paper* (also issued from 56, Paternoster-row) are among the best publications of their kind. Among the contents of the last-named is an article on "Christian Art in the Fifth Century," and an outline of a drawing by Kate Greenaway, to be painted in competition for prizes.

ALMANACKS AND DIARIES FOR 1891.

WE have received Sprague's Architects' and Surveyors' Pocket Diary (London: Sprague & Co.) in two forms, a small pocket-book with the diary and tables inserted in it, and a larger one with Diary and Tables placed in two of the pockets, as separate pamphlets. We have before mentioned the tables of elementary statistics as very useful for reference.——"The British Almanac and Companion" (London: Published by the Stationers' Company) will be found, as usual, full of varied information. A very useful feature is its list of Acts of Parliament passed last session, abstracts being given of the more important ones. The article on "Architecture in 1889-90" is by Mr. R. Langton Cole, and it gives a summary of the principal events of the year in the architectural and building world, with, on the whole, judicious comments. The article on "The Art of the Year" is by Mr. Cosmo Monkhouse, and that on "Science of the Year 1889-90" by Mr. E. W. Maunder. Mr. W. T. Lynn, F.R.A.S., contributes an interesting article on "Observatories."——"Calvert's Mechanics' Almanack" (London and Manchester: John Heywood) is now in its eighteenth year of publication, and its contents are as varied as ever, rendering it a useful workshop companion.——"The City Diary and Almanack" (London: W. H. & L. Collingridge, *City Press* Office) will be found to contain, as usual, a very great deal of useful information, particularly with regard to the Corporation of London and City affairs generally.——The "Law Almanack" (London: T. Scott & Co., 1, Warwick-court, Holborn) is a very useful sheet almanack, mounted on stiff pasteboard.——The "Railway Diary and Officials' Directory" (London: McCorquodale & Co., Limited) contains information of a special character, not found elsewhere, relating to the administration of our railways. The "Railway Almanack" is a useful sheet issued from the same office.——The "Gas Engineer's Pocket Almanack and Lighting Table" (London: W. Sugg & Co.) contains, as hitherto, a great deal of special information.——"Blackwood's Shilling Scribbling Diary" (London: Griffith, Farran, & Co.) is sent to us as a specimen of the rest.——"The Architect's Diary," "The Builder's Diary," &c., &c. (London: Hudson & Kearns, 83, Southwark-street): Just as we go to press, and too late for detailed notice, we have received from the publishers a parcel of their well-known and much-appreciated diaries for the use of architects, builders, and others. The excellent and special features of these diaries have so often been spoken of with commendation in our columns that, even if we had time and space at our disposal now, it would not be necessary to say more than that these publications seem to fully maintain their good reputation. The same publishers also send us a selection of their excellent date-indicating blotting-pads and diaries.

TRADE CATALOGUES, &c.

MESSRS. COTTERELL BROS., Bristol, send us their new Pattern-book for 1891, a very bulky collection, including a large number of serviceable papers and wall coverings, many of them washable.——Messrs. Measures Brothers send us a very convenient pocket section book of iron and steel joists, girders, &c., with the safe distributed loads for various spans. It gives a great deal of very useful information in a very small space.——Among other catalogues received are those of the Archer Pipe Company (whose well-known pipe-joint for sewers was described in our paper two or three years ago); Messrs. G. Bailey Toms & Co., of Lawrence Pountney-hill (who send us a useful illustrated list containing a large number of sections of iron and steel joists, &c.); Messrs. D. Hulett & Co. (a catalogue of wrought-iron gas-brackets, chandeliers, &c.); and the Bennett's Iron-foundry Co. (catalogue of tomb railings, &c.).

Correspondence.

To the Editor of THE BUILDER.

HANOVER CHAPEL.

SIR,—Surely some protest will be made against the destruction of Hanover Chapel, Regent-street. Have we no respect for the memory and the works of our greatest English architects, and are buildings which are landmarks in the history of Art to be removed at the will and pleasure of any one who happens to be their possessor for the time being?

The portico of Hanover Chapel is, without doubt, one of the finest architectural objects in the West-end of London, and is the work of the greatest Classical architect of the nineteenth century—one whose mighty genius had, alas! few opportunities of displaying itself. Those, however, who knew the late Professor Cockerell, and who have seen his wonderful "restorations" of buildings in Rome, Athens, &c., can well appreciate his greatness, and I feel sure that if the most ordinary observer will just take the trouble to look at the Hanover Chapel portico from the opposite side of the road, he will be easily able to realise the loss which our street architecture will sustain in its removal. H. W. BREWER.

December 29, 1890.

WESTMINSTER ABBEY COMMISSION.

SIR,—In your notice of the voluminous evidence contained in the "First Report" of the Westminster Abbey Commission, it is not surprising that a slight misapprehension of my proposal should have crept in, namely, that I proposed a wreath of chapels to be entered from the Chapter House. Curiously enough, this misapprehension is shared by the Archbishop of Canterbury, whose evidence you may have read without referring to mine. In reply to question No. 715, "Do you propose an entry from the chapel into the Chapter House?" you will find my answer, "No."

His Grace, in reply to question No. 1,147, said that the proposed sacred chapel should be as closely connected with the Abbey as possible, and I venture to submit that, with the exception of the Abbey Green on the north side of the Abbey, the vacant space around the Chapter House is nearer to the interior of the church than any site yet proposed.

If the great expense were to be incurred of purchasing and removing the houses facing Old Palace-yard and Abingdon-street, the revealed Chapter-house girt with a wreath of chapels may be made an effective group. That it would be architecturally correct is proved by the existing chapels built betweeen the flying buttresses of the Abbey itself.

If the houses be not purchased and pulled down, the proposed chapels could be built one at a time, as occasion may require, without producing any appearance of incompleteness as seen from Old Palace-yard.

Proximity and economy may, therefore, be urged in favour of the scheme which, in compliance with due request, I ventured to lay before the Royal Commission. EDWARD J. TARVER, F.S.A.

*** See "Note" and illustration on page 7.

THE ARCHITECTURAL ASSOCIATION SUBSCRIPTION.

SIR,—In your report last week of the meeting of the Architectural Association, and which report was necessarily abbreviated, my remarks upon the raising of the subscription to present members are, as reported, likely to convey a wrong impression, and lay me open to the charge of inconsistency; so perhaps you will be good enough to afford me space in your paper for an explanation.

In June, 1885, during the presidency of the late Mr. C. R. Pink, a meeting of the Architectural Association was held for the revision of some of the rules, and I then moved a resolution to the effect that the subscription of all members should be raised to one guinea. The proposal at the time attracted much attention, and after considerable discussion was negatived by a majority of 9: 70 voting against it, and 61 for it. Amongst the minority were, I venture to think, the most active members and reformers of that time; though there were many in the majority who equally had the welfare of the Society at heart.

I felt, however, after such an expression of opinion, that it would be a great mistake to attempt to repeat the motion, and I have more than once since publicly expressed this view.

When the Committee last session presented their excellent report and proposals for revising the scheme of education in the Architectural Association, they advised that the subscription of *town* members only should be raised to a guinea, country members remaining at the old figure, viz., half-a-guinea. This was carried, but by a small majority, and was, I have a reason to know, received with dislike by many old members, who strongly objected to pay more than they did at present. They were willing to remain on the list, but they did not see the force of being asked to contribute more to advantages they did not reap the benefit of; and I am persuaded that if the new rule giving effect to this resolution had been passed, it would have resulted in a considerable secession from our ranks.

The sub-committee appointed to revise the whole of the Rules very carefully considered this question of the subscription, and in their report unanimously advised the adoption of a rule raising the entrance fee from a guinea to two guineas, and the subscription for all *new* members (after a certain date) from half a guinea to a guinea. The adoption of this rule I did my utmost to impress upon the meeting you reported in your last issue, and it was adopted, after an animated discussion, by a large majority. I believe that now we shall retain the old members, who, though they have ceased to take an active part in the work of the Architectural Association, yet take a keen interest in their *alma mater;* and that those in future joining the Architectural Association, and participating in all the advantages which it is proposed to add to the society, should in all justice and fairness be called upon to pay an increased entrance-fee and subscription. If the Architectural Association is to maintain its usefulness and efficiency, and at the same time to extend its educational advantages so as to keep abreast of the times, funds must be found, and I believe that the solution of the difficulty which we have arrived at is the best one. COLE A. ADAMS.

ECHO.

SIR,—Could any of your readers give the benefit of their advice as to how to get rid of an echo in a single-room addition to a public institution recently built?

The room measures 17 ft. by 17 ft. and 15 ft. high. Walls built of stone and lime, and battened, lathed, and plastered in the usual manner. Floor is laid with Arbroath stone paving. There are no windows, light being supplied from a roof-light, and a stove is used for heating purposes. The ceiling on one side is coved, the coving commencing about 11 ft. from the floor.

The room is only occasionally required, and little or no furniture necessary.

The echo is so strong as to render the place nearly uninhabitable. BON ACCORD.

Dec. 22, 1890.

*** A stone floor, bare walls, and little furniture, furnish just the elements for an echo. Hard, flat surfaces, not broken up in any way, are sure to produce echo. It is difficult to know what could be done with such a room without disproportionate expense; but probably a carpet on the floor would considerably reduce the echo. Curtains on the walls would do still more, but as they could probably be of no other use, it would not be worth while to do that.

OBITUARY.

MR. C. P. EDWARDS.—We regret to hear of the death of Mr. C. P. Edwards, architect, on the 18th ult., at Hammersmith. He died of heart disease, after ten days' illness. He was born at Bath, May 20, 1853, and was articled to Messrs. Wilson & Wilcox, of that city, and was afterwards in the employment of the late Professor Donaldson and Mr. J. T. Carr, of Bedford Park, Chiswick. He designed a new Mission Hall at Chiswick, which was only opened on the Saturday before his death, and the funeral service was conducted in that building. The interment took place in Hammersmith Cemetery.

VENTILATORS TO SOIL-PIPES.—In reference to the recent correspondence between Mr. Buchan and Mr. Simmance on this subject, we have received an important letter from Mr. Sugg, but as the diagram which accompanies it was received too late for production in this number, we hold over the letter till next week in order to publish it along with the diagram.

REMOVAL.—Messrs. H. Stopes & Co. have removed from 24, Southwark-street, to 10, Queen-street, Cheapside.

The Student's Column.

VENTILATION AND WARMING.—I.

INTRODUCTION.

ALTHOUGH it may be possible to investigate separately, to a certain extent, the theory of ventilation apart from that of warming; in the practical application of theory the scientific principles upon which the satisfactory installation of any scheme of ventilation depends cannot be dissociated from those which govern the practice of warming, and it will, therefore, be necessary in this series of articles to take into consideration the laws which govern the application of heat to the purpose of warming the various parts of a building.

Directly we propose to introduce any scheme of ventilation into a building, large or small, it becomes imperatively necessary that we should know the method by which that building is, or will be, warmed. Conversely, before any satisfactory determination of the probable efficiency of any particular means of warming can be arrived at, the manner and extent of the ventilation of the building must be known.

Inattention to the correlation of ventilation and warming has been the cause that has led to the failure of very many attempts at ventilation in this country, and has likewise contributed to the inefficiency of many a heating apparatus, with all the disappointment resulting therefrom.

Speaking in general terms, with any system of ventilation in use, greater heating capacity must be provided; the extent of the increase of warming power will be a subject for our consideration in subsequent chapters. For the present, it suffices to remember that any empirical rule for determining the size of a heating apparatus based solely upon the cubical contents of a building or apartment, or upon the number of persons that can be congregated therein, must be inadequate for all cases, unless consideration is also given to the influence of ventilation and other factors in the problem.

Ventilation may be defined as the substitution of fresh or pure air for that which has become foul or vitiated.

The necessity for the provision of pure air in all situations where human beings live is now becoming fully recognised. With increased knowledge of the laws of hygiene amongst the public comes the conviction that only in a pure atmosphere can the vital functions be sustained at their highest point and healthy life be maintained. Although it is possible for us to exist in a vitiated atmosphere for a considerable length of time, this can only be done at the cost of diminished vitality, rendering us less able to resist the attacks of disease to which we are constantly exposed. Much of the evil effect which is popularly supposed to result from the transition from heated places of public resort, churches, theatres, &c., to the cold night air is largely due to the enfeebled condition of health to which the occupants have been reduced by the vitiated atmosphere they have been inhaling.

The necessity for a pure atmosphere being recognised, we have now to consider what is a pure atmosphere, and in what respect it differs from a vitiated atmosphere.

Absolutely pure air may be taken as composed of oxygen, nitrogen, and water vapour, with a small percentage of carbonic acid, ozone, and salts of sodium. In normal air, however, organic matter and ammonia are almost universally found. In vitiated atmosphere we find the amount of carbonic acid and of organic matter and ammonia increased with the addition of other impurities, while the health-giving constituent, ozone, is absent.

The most important source of vitiation in connexion with the question of ventilation is the contamination by the products of respiration and transpiration, and the combustion of light-giving agents.

Of the products of respiration from the lungs and transpiration from the skin, organic matter is that which has the most prejudicial effect in the vitiation of air. It is this which imparts to badly-ventilated rooms their close, stuffy, and fetid odour, and to this organic impurity is largely due the baneful influence of vitiated air upon our vitality. Into the precise nature of this organic matter it is not necessary for us to enter; it is sufficient for our purpose that its addition to the atmosphere is a source of vitiation.

The other products of respiration and transpiration which mainly concern us are carbonic acid and water vapour. The carbonic acid is injurious to health, though probably less so than the organic matter; the added water vapour is prejudicial only by the increased rapidity of decomposition of the organic matter, and the concurrent development of disease germs to which it tends.

As, however, the amount of organic matter thrown off is in constant relation to that of carbonic acid and water vapour, and the amount of these latter present in any given atmosphere is far more easily ascertained than that of the organic matter, it is convenient to take the amount of carbonic acid in the air as the test of its purity.

This method will also enable us to connect the extent of vitiation caused by the agencies we have already considered with that resulting from the products of combustion, for, amongst these also, carbonic acid takes a prominent position.

We have then to determine, in order that we may be able to distinguish fresh air from foul, what amount of carbonic acid is present in vitiated atmosphere. In air of normal purity it has been found that the percentage of carbonic acid varies usually from 0·02 to 0·05, and that on the average 0·04 is the percentage of carbonic acid present in normally pure air. The amount of vitiation which is permissible may be taken as that which is the least amount that becomes evident to the sense of smell in its keenest activity. This has been found by experiment to co-exist with an added percentage of 0·02 of carbonic acid, and we may therefore conclude that air with this added percentage is foul, and below that, fresh.

It should be carefully noted that, in this connexion, the humidity of the atmosphere is a factor of considerable importance. This percentage of 0·02 has been arrived at by the experiments of Dr. de Chaumont in an atmosphere of 73 per cent. humidity, at a temperature of 63 deg. Fahr. The average humidity of the atmosphere in our English climate is from 70 to 80 per cent., while that of America is from 30 to 40 per cent., and of Germany 50 per cent.

The humidity of the atmosphere is of importance, because the greater the humidity the less the amount of organic impurity which can exist without recognition by the sense of smell, and therefore, in accordance with our presumption, the less the extent of vitiation permissible. We have frequently noticed that in crowded rooms, under precisely similar conditions, except that of humidity, the increase of moisture in the atmosphere has invariably been attended with an increase of the fetid odour resulting from the organic impurity, easily recognisable by the sense of smell.

We have, therefore, arrived at the conclusion that, for our ordinary hygrometric conditions, it is desirable that the vitiation of the atmosphere shall not exceed that represented by an addition of 0·02 per cent. of carbonic acid.

We shall now proceed to investigate the manner in which this addition may be caused. First, by the personal production of impurity in the atmosphere; it has been found, by experiment, that the average amount of carbonic acid evolved by an adult man per hour is 0·5 of a cubic foot during repose, 0·75 during very moderate exertion, and 1·5 during strong exertion.

The dilution of these amounts to our standard 0 02 per cent., or 0·0002 in each cubic foot, can therefore be ascertained by the following expression,—$\frac{C}{V}=R$, where C is the amount of carbonic acid produced per hour, V the admissible degree of impurity; and R the number of cubic feet of air required per hour to produce the desired dilution. Working this out, for the figures given above, we have 2,500 cubic feet per hour during repose; 3,500 cubic feet during moderate exertion, and 7,500 cubic feet during strong exertion.

The amount of vitiation produced by women and children is less than that from an adult man, and consequently the amount of fresh air required by them is also less. On an average the amount for women may be taken at two-thirds, and for a child at one-half that for an adult man.

That these figures are not excessive is shown by the experience of work in mines, where it is found that if the amount of fresh air provided is less than 6,000 cubic feet per hour for each man, a diminution of their effective working power results.

Comparing our figures thus arrived at with the existing practice in foreign countries, we find that in America 600 to 2,000 cubic feet of fresh air per hour are provided for each person, according to the purposes for which the rooms are used; in Germany 600 to 750 cubic feet for schools, 1,200 to 2,000 for meeting-rooms; in Austria 900 cubic feet for theatres and banquetting-halls, and 1,500 cubic feet for ball-rooms, &c. These diminished figures are partly accounted for by the less humidity of the atmosphere, to which we have already referred, and partly by extraneous sources other than the ventilation machinery, which, as we shall hereafter see, modify the conditions considerably.

In addition to the personal vitiation of the atmosphere, we have also to take into account the impurity occasioned by lighting and heating agents; thus every cubic foot of coal-gas consumed in lighting produces 2 cubic feet of carbonic acid, besides other impurities, to dilute which at least 2,000 cubic feet of air should be allowed.

SURVEYORSHIPS.

BRADFORD WATERWORKS ENGINEERSHIP.—The Waterworks Committee of the Bradford Corporation on the 23rd ult. unanimously decided to recommend that Mr. James Watson, Waterworks Engineer to the Dundee Corporation, should be appointed to fill the post of Waterworks Engineer to the Bradford Corporation (in succession to Mr. A. R. Binnie, now Chief Engineer to the London County Council), at a salary of 1,000*l.* per annum. There were sixty-one candidates for the appointment.

RUGBY.—At the last meeting of the Rugby Local Board, Mr. Seabroke moved the appointment of Mr. R. T. Stewart, son of the late Surveyor, as Assistant Surveyor for twelve months at a salary of 50 guineas.—Mr. Loverock opposed on the ground that they had just appointed a new Surveyor at 50*l.* a year less salary than his predecessor, and it would be inconsistent to give that sum to the ratepayers with one hand and take it away with the other.—Messrs. Oldham and Satchell were also against providing the new Surveyor with an assistant before it was known whether he wanted one or not. The latter proposed an amendment that the appointment be for three months.—The original proposition was carried by six votes to three.

GENERAL BUILDING NEWS.

THE BRISTOL BUILDING TRADE IN 1890.—A correspondent writes:—One of the features of the building trade in Bristol in 1890 is the recovery of the speculative business in Redland, Bishopston, and Bedminster. The houses are distinctly of a better class than formerly erected, and while this applies to all three districts named, it does so especially to the first two. Houses in Bristol, varying in rent from 20*l.* to 35*l.*, have been hitherto lamentably deficient in bath accommodation and in the distribution of hot water for domestic use to be found in dwellings of a similar class in many other localities. Possibly the high charges of the Bristol Water Company have had much to do with this, but certain it is that a new departure having been made, the builders have found the demand for the better class of houses a real one, and have been encouraged by the improved prices obtained. People in numerous instances have left dwellings hitherto occupied, and some of them conveniently situated and provided with modern requirements, to occupy new buildings simply on account of the comfort of a properly-fitted bath-room. Building is still going on, and unless the improvement in trade is wonderfully maintained, the impression is that the thing is being rather overdone. In Totterdown, another residential district, Sir Greville Smyth is taking powers for diverting paths so as to open a considerable area of land to the builders. Semi-detached villas, and houses of a superior kind are to be erected here. In general building there has been a good deal done, and some heavy contracts are still in hand. The extension of the lunatic asylum at Stapleton is one of them, and Bedminster Liberal Club and public hall, to accommodate nearly 2,000 persons, another. Messrs. C. Wills & Son have had a fine new factory built in Rupert-street, to meet the requirements of an extending wholesale clothing trade; the Barleyfields Board Schools, the police-station at Lower Redland, a handsome school in Cheltenham-road, built for 300 girls of the middle class by the Merchant Venturers, and to be opened in January; Lady Haberfield's Almshouses, an extensive and ornamental block of buildings at the Hotwells; the completion of the Clifton College and the erection of the tower; a new Wesleyan chapel at Bishopston, and a centre for mission work for the Highbury congregation (both expensive pieces of work), are among the items which can be called to mind. There was also a large expenditure, something

like 15,000*l.*, on extensions and improvements at the Bristol General Hospital, and a good deal of work in rebuilding business premises, particularly substantial modern inns in place of the older and often dilapidated public-houses bought by the brewery companies. Amongst the opportunities for industry in the coming year are the new factory for Messrs. Fry, the cocoa manufacturers, the foundations of which are being put in; the new medical wing of the University College, in place of a barn-like structure now used; and the building and completion of churches under the local extension scheme. The formation of a code of rules governing the organisations of the masters and men was regarded by the trade generally as a matter for congratulation, and already has operated usefully in a dispute which arose. The Bristol Sanitary Committee is taking powers for certain by-laws regarding building materials, hitherto not held in Bristol, though they are in force in the suburban jurisdictions. The details of the proposed new rules have not been yet reported to the Town Council, who at the last meeting decided not to sanction by-laws a copy of which was not before them.

MARBLE PULPIT, CRIEFF PARISH CHURCH.—On the 21st ult., the marble memorial pulpit for St. Michael's parish church, Crieff, Perth, was formally inaugurated. The pulpit is the work of Mr. D. Beveridge, sculptor, Perth. The body is of Sicilian marble, is Gothic in design, and octagonal in form. It is supported by eight columns of coloured marble, while the lower base is formed of polished Peterhead granite. The front panel bears a figure in relief representing the Saviour delivering the Sermon on the Mount, and is from the chisel of Mr. Stevenson, Edinburgh.

RE-OPENING OF BREAGE CHURCH.—Breage Church, Cornwall, was reopened on the 26th ult., after renovation. The church has been re-seated throughout by new, open sittings, made of oak. The carved panels of the old pews have been utilised for a dado round the church. New rood and tower screens have been provided. The rood screen and carved reredos were supplied by Messrs. Cox, of London, who have also done the decorative painting in the chancel. The roof of the sacristy has been repaired, the original character being maintained. A new pulpit has been erected, the base being of local granite, and the upper part of polyphant, the panels being filled with polished Duporth stone. The church has been retiled. The alterations were carried out under the supervision of the Rev. Ernest Geldart, of Little Braxted, Essex, by the contractor, Mr. Julian, of Truro. During the restoration there were found on the walls four frescoes, representing Our Saviour, St. Christopher, St. Michael, and the first Bishop of Cornwall. There were also discovered the tombs of Margaret Godolphin and five other members of the Godolphin family. The inscriptions, it is stated, are to be carefully reproduced and placed in suitable positions in the church. The total cost of the alterations, including a new organ, has been about 3,090*l.*

HOSPITAL, SEAMEN'S HOMES, EGREMONT.—Some time ago (says the *Liverpool Daily Post*) it was announced that Mr. William Cliff had decided to add a hospital wing, at a cost of 2,000*l.*, to the Cliff Home, among the Homes for Aged Mariners at Egremont. This necessary adjunct to the home has been specially supervised by the honorary medical officers to the institution, Dr. Bell and Dr. Hubbard. It includes an arrangement of classified wards connected by a long corridor with the south side of the main building. The ground-floor accommodation comprises an entrance-hall and staircase, with two wards — each 24 ft. by 18 ft. — and an intermediate nurses' room. A corridor leading out of the hall connects the kitchen, surgery, bath-rooms, &c., and there is also a mortuary, approached from the outside. The first floor contains similar accommodation, and the wards are lofty and well lighted. The elevation of the building, which has been designed to harmonise with the main façade, is well broken up, having a large oriel window,—the height of two storeys,—to the river front. Red Ruabon bricks and Stourton stone dressing for the windows and other features have been used, and the roofs, which are hipped, are of green slate, with red ridges. The works have been carried out by Mr. Prichard, of Little Neston, from designs prepared by Mr. David Walker, of Liverpool, the architect to the institution.

NEW BAKERY AT NEWPORT (Mon).—*The Western Mail* describes a new "hygienic bakery" which has been erected at Newport (Mon.) for Mr. Alfred Bland from plans by Messrs. Habershon & Fawckner, architects, London, Mr. John Linton being the builder.

BRADFORD ABBAS CHURCH.—The parish church of St. Mary, Bradford Abbas, was re-opened on the 11th ult., after restoration. The church, a fine Perpendicular structure, consists of chancel, nave, and aisles, with an embattled tower. For some years past it has been falling into disrepair, and in 1888 the vicar (the Rev. Gordon Wickham), together with the churchwardens and a number of the leading parishioners, started a restoration fund, towards which the Warden of Winchester College (the living is in the gift of the College) was the first subscriber. When 400*l.* had been gathered, Mr. A. W. Bridge, lord of the manor of Clifton Maybank, offered to give the 700*l.* which was required to make up the 1,100*l.* which was needed, and the work of restoration was commenced early in 1890, from plans prepared by Mr. C. B. Benson, and under the contract of Mr. J. Andrews, of Thornford. Mr. Benson's first plans suggested the use of oak tie-beams and king-posts in the place of the iron rods which had been placed of late years to support the roof. These plans, however, were subsequently modified, and in order to preserve the character of the roof iron rods were again resorted to, their position being improved. Most of the old timbers were found to be too full of dry-rot to be used again, but the mouldings and carvings have been carefully copied. The carving has been mainly done by Messrs. Grassby & Son, of Dorchester, and six of the angels by Mr. Harry Hems, of Exeter. The painting and decoration of the interior of the edifice have been carried out under the personal superintendence of Mr. W. Raymond (Raymond & Penny, Yeovil). Formerly the whole of the roof was decorated, the panels having red and white roses alternately, and the main and intermediate beams being painted in the "barber's pole," or "ribboned" fashion. There were also a number of carved angels holding shields or scrolls. On removing the old paint from some of these shields the coats-of-arms of Devon (Courtenay), Mortimer, and Montague (Sandwich) were found. The roof is now of new oak with no decoration, except in places where the old beams were not too rotten to be re-used, and these retain their former appearance. The coats-of-arms unexpectedly revealed have been faithfully reproduced, and, in addition, the following now appear: Winchester College, Sarum, Horsey, Clayton, Williams (vicar *res.* 1826), Bridge, Lothian, and Talbot. In the chantry, the principal bosses have been richly gilded (the gift of Mr. W. Raymond), and the angels with shields, and the old monograms found on the latter—"J. S.," John Saunders, Abbot of Sherborne, and a trade-mark of the West of England Linen Company—have been retained. The hot-water pipes for heating the edifice, which formerly ran up the centre of the nave in full view, have been moved to the sides of the church, and three additional coils have been fixed by Mr. Read, of Sherborne. The work of re-hanging the peal of bells and of putting them into serviceable condition was entrusted to Messrs. Gillett & Johnston, of Croydon.

PROPOSED PUBLIC OFFICES FOR DRIGHLINGTON.—A public inquiry was held on the 16th ult. by Colonel J. C. Hasted, R.E., one of the inspectors of the Local Government Board, with reference to an application by the Drighlington Local Board for sanction to borrow 1,150*l.* for providing public offices. The chairman of the Board (Mr. L. J. Booth) and other principal ratepayers were present. After taking the evidence of one or two members of the Board in support of the application, to which there was no opposition, the Inspector went over the premises agreed to be purchased, and he will shortly make his report.

SANITARY AND ENGINEERING NEWS

PROPOSED SEWAGE TREATMENT WORKS FOR PUDSEY, STANNINGLEY, AND FARSLEY.—The *Leeds Mercury* reports that at the meeting of the Farsley Local Board, held on the 15th ult., a letter was read from the Clerk to the Pudsey Local Board, in which it was stated that their Sanitary Committee were of opinion that a joint scheme of works for the treatment of sewage from those portions of the Pudsey and Farsley Local Board districts, and that portion of the Leeds Corporation district, which are contiguous to one another at Stanningley, could be worked with advantage to all three local authorities at some point in the valley, before the beck reaches the river. The Board decided to receive a deputation from the Pudsey Board to discuss the question.

NUNEATON SEWERAGE WORKS.—On the 18th ult., Mr. J. Thornhill Harrison, one of the engineering inspectors of the Local Government Board, held an inquiry at Nuneaton into the application of the Local Board for permission to borrow 1,350*l.* for improvements at the sewage works and in various parts of the district. The Local Board was represented by Alderman Haddon (chairman), Rev. Mr. Swinnerton, Mr. J. Estlin (Clerk), and Mr. J. S. Pickering (Surveyor). The only item to which the Inspector took exception was one of 220*l.* for renewals to the machinery at the sewage works, it transpiring that the engines were purchased by a loan repayable in thirty years, and that this had not been cleared off. It was understood that the Local Government Board would be recommended to consent to a loan for the various other matters.

THE GLASGOW SEWAGE BILL.—The Glasgow Police (Sewage, &c.) Bill, which has just been deposited, has for its object to authorise the Magistrates and Council as Police Commissioners to acquire lands for sewage purposes, and to raise money for that purpose. The Bill is divided, according to the *Glasgow Herald*, into three parts:—I. Sewage purposes; II. Police purposes; III. General. Under the first heading power is asked to acquire certain lands in the Bridgeton district for the purpose of erecting thereon works for the treatment of sewage, and also to borrow for sewage purposes a sum not exceeding 100,000*l.* on security of the sewage assessment; this loan to be paid off by the application of a sinking fund at the rate of 3⅓ per cent. on the amount for the time borrowed under the Act. An additional assessment not exceeding 2d. in the 1*l.*, payable in equal proportions by proprietor and occupier, is also provided for. Under the second heading the Police Commissioners ask power to purchase and utilise, if necessary, lands for the disposal of the city manure, as well as to borrow 100,000*l.* for general Police purposes, for the paying off of which a 2½ per cent. sinking fund is provided. The other sections of the Bill have reference to the amendment of previous Acts and the administration of the funds of the Police Commission.

STAINED GLASS AND DECORATION.

NEW WINDOW, CHRIST CHURCH, SOUTHPORT.—Christ Church, Southport, has been provided with a stained glass window, as a memorial of the late Rev. Arthur Pearman. The subject represented is the "Good Shepherd," the artists being Messrs. Heaton, Butler, & Bayne, of London. The window has been placed in the south side of the church.

MEMORIAL WINDOW, QUORNDON CHURCH.—A stained glass window has recently been placed in Quorndon church, Leicester, to the memory of the late Rev. Robert Stammers, M.A. The window (one of two lights) is filled with figures of St. Paul and St. Bartholomew, with small subjects underneath. The windows were entrusted for execution to Mr. Herbert Gardiner, of Leicester.

FOREIGN AND COLONIAL.

FRANCE.—M. Antonin Mercié has been entrusted with the commission for the national monument to Joan of Arc to be erected at Domrémy. M. Jules Ferry, President of the Conseil Général and a former Minister of Fine Arts, is shortly to meet M. Mercié at Domrémy to settle with him as to the site of the monument, which will be in marble, and the pedestal in Vosges granite without any ornament.——M. Eugène Guillaume, who has been appointed director of the École Française at Rome, has sent to the Comédie Française, as a parting gift, the bust of the late Emile Perrin, former administrator of that theatre.——The "Leda" of M. Roulleau, one of the finest works in marble in the East Salon, has been offered by the State to the Museum of Sculpture at Amiens.——M. Ringal, sculptor, has been commissioned by the Duchesse de Pomar to execute a marble statue of Marie Stuart, which she proposes to present to the city of Paris.——The Professorship of Archæology at the Bibliothèque National, which was filled by M. Carl Wescher, has been allowed to lapse.——The death is announced of Mdme. Daubigny, widow of the eminent landscape-painter.——A committee of the friends and admirers of Alphonse Karr, the novelist, has been formed to procure the erection of a monument to his memory at Saint Raphaël (Var).——The Municipal Council of Dijon has voted the demolition of the château commenced there in 1478 by Louis XII., which, after having served as a State prison, had been subsequently a barracks for gendarmerie. This building, long since closed as a "Monument Historique," had fallen into ruin, and as it was decided that it could not be usefully restored, it was "de-classed" by the Ministry of Public Instruction.——The death is announced of M. Emile Richard, President of the Municipal Council of Paris, formerly President of the Commission des Beaux-Arts, and author of the report on the artistic decoration of the Hôtel de Ville.——Following on the competition recently decided at the Hôtel de Ville, of which the results have been already given, the "Société Française des habitations à bon marché" has just opened, to the whole of France, a second competition which will comprise three sections: 1st, an enquiry into the state of cheap houses or "logements à bon marché" in town and country during the past fifty years; 2nd, designs for such houses both in blocks and isolated; 3rd, the financial combinations to be adopted for erecting such buildings on a remunerative basis.——The "Société Protectrice des Monuments Rouennais" has addressed to the Municipal Council a memorial for the erection at Rouen of a statue to Fontenelle, author of the "Entrétiens sur la pluralité des Mondes," whose name is already given to a street in the town.——Some interesting statues have just been discovered a Martres-Tolosane (Haute Garonne), especially a fine statue of Minerva, a bust of an Emperor, and many bas-reliefs and fragments of statues. These have been found close together at a depth of 3 to 4 mètres below the surface of the ground. The absence of any foundations or other architectural remains has led to the conclusion that this was the site of a large sculptor's atelier rather than of a mansion.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Baths at Woodside	Halifax Corporation..	.....	Feb. 14
*New Municipal Buildings, Police Court, &c	Bury Corporation	150*l.* 100*l.* and 50*l.*...	Mar. 31

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Re-building a Mill, Longhill, near Llanbryd, N.B.	.....	A. & W. Reid	Jan. 6
Two Shops and Dwelling-house, Pontypridd	Robt. McIntosh	Fred. Gibson	do.
Steel Rails, Fishplates, &c.	India Office	*Official*	do.
Iron Castings, &c.	Manchester Corp.	do.	Jan. 7
Marine Hotel, Ballycastle, Ireland	.....	Henry Seaver	do.
*Sewerage Works	Epping R.S.A.	Edmond Egan	Jan. 8
Road Materials	Dorset County Council	*Official*	do.
Alterations to Top Lodge, Queen's Park..	Manchester Corp.	do.	do.
Ironwork, &c. Mount-street Open Space	do.	do.	do.
*Making-up Roads	Wood Green Loc. Bd.	C. J. Gunyon	Jan. 9
*Supplying Tables	School Bd. for London	*Official*	do.
Explosive Magazine, Penrhyndeudraeth, Merioneth	Jas. R. Watson	A. Roberts	do.
House, West End, Forres, N.B.	Mr. Taylor	.....	do.
*Sea Defence Works, Walton-on-the-Naze..	Improvement Commrs.	*Official*	Jan. 10
*New Bridge over River Stour, &c.	Essex County Council	F. Whitmore	do.
*Chapel at New Cemetery, Morden	Battersea Burial Bd.	*Official*	Jan. 12
*Sewerage Works	Teddington Local Bd.	H. York	do.
New Service Reservoir (50,030 gallons) and Pipes, Alnmouth	Alnwick U.R.S.A.	F. R. Wilson	do.
Steelwork for Bridges, &c.	India Office	*Official*	Jan. 13
Work at Eccup Reservoir, near Leeds	Leeds Corporations ..	Thos. Hewson	do.
*Sewerage Works	Tottenham Local Bd.	J. E. Worth	do.
*Works and Materials	Wandsworth Bd. of Wks	*Official*	do.
*Main Drainage Extension	West Ham Council ..	Lewis Angell	do.
*Execution of Works for Three Years	Hackney Bd. of Works	J. Lovegrove	Jan. 14
Stores, Offices, &c.	Wibsey Slack Side Indus. Co-op. Soc. ..	John Drake	do.
*Removal of Dirt, Dust, Ashes, &c.	Crown Estates Paving Commrs.	*Official*	do.
*Roadmaking and Paving Works	Hammersmith Vestry	H. Mair, C.E.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Re-building Portions of Reformatory, Kingswood, near Bristol	Committee	H. C. M. Hirst.....	Jan. 15
Offices, Workshops, &c. Vastern-road, Reading	Henry Lewis.....	W. H. Bell	do.
*Irrigation Works	Met. Asylums Board..	*Official*	do.
*Erecting and Completing Boundary Wall, Railing, and Entrances to Churchyard	Commrs. of Sewers ..	do.	Jan. 16
*New Post Office, Stratford-on-Avon	Com. of H.M. Wks, &c.	do.	do.
Gas Mains, Fittings, &c.	Ashby-de-la-Zouch Union	do.	do.
Villa Residence, Buckfastleigh	.....	Michelmore & Son....	Jan. 17
*Drainage Works, Battersea-park	London County Council	*Official*	Jan. 19
*Public Conveniences, Dulwich-park	do.	do.	do.
*New Police Station, &c. at Leek	Staffs. County Council	W. Sugden & Son	Jan. 22
*Erection of Houses, &c. Lydd, near Kent	Admiralty.....	*Official*.....	Jan. 23
*Improvement of River Lea	Birmingham Public Works Com.	W. S. Till	Jan. 24
Convalescent Home, Lanark	Glasgow Western Infir.	H. Herbertson & Co...	No date
Villa Residence, Roundhay-road, Leeds ..	Mr. Hutton	.....	do.
*Supply of Materials and Execution of Works	Liverpool Corp.	*Official*	do.
Mansion, near West Hartlepool	.....	J. Sargeant	do.
Additions and Alterations to "Hexham House," Newcastle-on-Tyne	.....	B. F. Simpson.....	do
Ironwork Stores, &c. Marsden, South Shields	Whitburn Coal Co. Lim.	.....	do.
Enlargement of Chancel, New Vestries &c. St. Paul's Church, Holgate, York	.....	Demaine & Brierley ..	do.
Forming and Sewering, Oxford-street, Workington	.....	R. H. & H. Hodgson ..	do.

PUBLIC APPOINTMENTS.

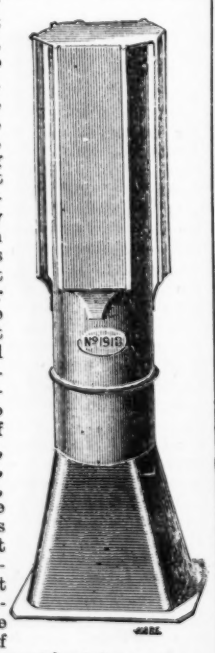
Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
Sanitary Inspector	Dumbarton C. C.	200*l.*	Jan. 6
Two Sanitary Inspectors	Renfrew C. C.	125*l.*	Jan. 10
*Clerk of Works	Hymer's College, Hull	3*l.* 3*s.*	Jan. 11
*Accountant Clerk	Civil Service Com.....	Not stated	Jan. 14
*Surveyor's Assistant	Burton-on-Trent Coun.	150*l.*	do.
*Borough Engineer and Surveyor	Reading Council.....	400*l.*	Jan. 17

Those marked with an Asterisk (*) are advertised in this Number. *Competition*, p. iv. *Contracts*, pp. iv., vi., viii., x., *and* xii. *Public Appointments*, p. xxvii.

PRETORIA, SOUTH AFRICA.—New market buildings are about to be erected here. The site of the buildings is on the Market-square, at the corner of Church-street and Van der Walt-street. The two principal frontages are respectively 300 and 250 ft. in length. In the centre of the site is the market house for whites, and the smaller one adjoining it for coloured people. The former measures 155 ft. by 60 ft., and has a roof in one span. At the western corner is a clock tower about 70 ft. high. The style of the building is described in a local paper as of a Free Dutch Renaissance, the material being red brick and stone. The ground-floor of the frontages is occupied entirely by shops, with a bar or restaurant at the corner. The cost of the entire building will be about 36,000*l.* The architects are Messrs. Campbell & Dickson, A.R.I.B.A., and Frank Emley.——The Pretoria Waterworks and the railway from the Vaal River to Pretoria are both in course of construction; to the former of which Messrs. Campbell & Dickson, A.R.I.B.A., are the Resident Engineers, Mr. Pritchard, of London and Birmingham, being the Consulting Engineer in England. The railway is under Hollander management, the contractors being, however, English. Our informant is good enough to add, "We find your paper a great solace to us in this somewhat prosaic country."

MISCELLANEOUS.

BERRY'S IMPROVED WINDGUARD.—This windguard, manufactured by Messrs. Z. D. Berry & Sons, of Regency-street, Westminster, appears to possess some good points. The inventor claims that, after repeated experiments, extending over twenty years, he has succeeded in making a windguard which has at last solved the vexed problem, —how to cure smoky chimneys. A fatal fault in many cowls and windguards hitherto made has been, that the wind at some point or angle could strike down the chimney; this, however, it is urged, has been rendered impossible by the construction of "Berry's" windguard, which also claims to possess the advantage of acting as a powerful exhaust, accelerating an up-current, and acting as a ventilator, independent of the fire being lighted. Other points claimed are — 1st, that it cannot be injured in sweeping the chimney. 2nd, that it is noiseless, does not revolve, and having no movable parts, cannot get out of order. 3rd, that the rain cannot beat down.



SOCIETY OF ARTS.—The following are among the papers to be read at the Meetings of the Society of Arts, after the Christmas recess:—J. F. Green, "Steam Lifeboats;" A. G. Green, C. F. Cross, and E. J. Bevan, "Photography in Aniline Colours;" Carmichael Thomas, "Illustrated Journalism;" T. Emerson Dowson, "Decimal Coinage, Weights, and Measures;" Sir Roper Lethbridge, M.P., "The Proposed Irish Channel Tunnel;" Wm. Topley, F.R.S., "The Sources of Petroleum;" Colonel Sir Charles Wilson, K.C.B., K.C.M.G., F.R.S., "Methods and Processes of the Ordnance Survey;" E. J. Ravenstein, "Lands available for Colonisation;" Prof. J. J. Hummel, "Fast and Fugitive Dyes;" William Robinson, "The Use of Petroleum in Prime Motors;" J. Harrison Carter "Milling Machinery;" F. H. Cheeswright, "Breakwaters." The next series of Cantor Lectures will be by Mr. A. J. Hipkins, F.S.A., on "The Construction and Capabilities of Musical Instruments." The course of three lectures will commence January 26.

ELECTRIC LIGHTING IN ST. PANCRAS.—An important scheme of electric lighting has been undertaken by the Vestry of St. Pancras. Professor Henry Robinson (the Electrical Engineer to the Vestry) states that the installation which is now being carried out by the Vestry under his direction will serve the south-western part of the parish, and is intended to be followed by further stations to serve the rest of the district if the results were proved to be as satifactory from a commercial standpoint as was anticipated. He has adopted the "continuous current," and has fixed the electromotive force at 110 volts, to suit incandescent lamps. The mains will be laid on what is known as the "three-wire system," by which arrangement the current is transmitted from the central station at 220 volts along the two outside wires, whilst the third wire is kept at an intermediate potential differing from that of either of the outside wires by 110 volts. The lamps are in electrical contact with either of the outer wires and with this third wire. Half the lamps are connected to one outside wire and half to the other. In the event of the demand being greater on one side than the other, it is met by a supply from the station along the third wire. This arrangement enables current to be supplied at 220 volts for purposes of motive power and arc lights in addition to the supply at 110 volts for incandescent ligt ting. This is claimed to be by far the most efficient and economical system of distributing electrical energy under conditions which obtain in St. Pancras. The central station plant will be capable of supplying low-tension current to serve 10,000 incandescent lamps of 16-candle power simultaneously, and at the same time high-tension current will be provided on a separate set of mains to serve public lights in the streets, to the extent of 90 ten-ampère arc lights, or a larger number of lamps of equivalent candle-power, at the outset. There will be nine low-tension and two high-tension dynamos,—one of each sort serving as a stand-by, or reserve. All the dynamos will be driven direct by triple expansion condensing engines. There will be six sets of batteries or accumulators (capable of serving 800 or 900 lights) to work all the lights in use at periods of minimum demand when the engines and dynamos would not be working, and they will further act as an additional stand-by, or reserve. Provision is made at the outset for five miles of distributing mains, which are designed to carry current for 25,000 incandescent lamps of 16-candle power in use simultaneously, and separate mains are provided for the public street lighting.

HISTORIC TAPESTRY BURNED.—The *Western Mail* reports that on Saturday night a fire broke out at Eastnor Castle, near Ledbury, the seat of Lady Henry Somerset. The fire broke out in the library, and two valuable pieces of tapestry, representing "Summer" and "Autumn," were much damaged before the flames could be extinguished. The tapestry formed a portion of a set of four pieces which came from Fontainbleau, and were worked during the time of Louis XV.

TWO NEW MEMBERS OF THE COURT OF COMMON COUNCIL.—Mr. C. Val Hunter, A.R.I.B.A., and Mr. Alexander Ritchie, of the firm of Steven Brothers & Co., iron founders, have been elected members of the Court of Common Council, as representatives of Castle Baynard Ward. The City *Press* says that both of them "ought to be valuable members of the Court, since they state that they know the importance of silence;" but we have no doubt that both gentlemen will speak out when they deem it necessary.

FIRE AT THE R.C. CATHEDRAL AT EDINBURGH.—A serious fire occurred suddenly at the Roman Catholic Cathedral in Broughton-street, Edinburgh, on the 28th ult., during the hours of service. The side chapel in which it broke out was entirely destroyed, the damage being estimated at 2,000*l.*

LEGAL.

PERMANENT STRUCTURES:

THE LONDON COUNTY COUNCIL *v.* KNOWLES.

At the Thames Police-court, on December 23, Mr. Clarence Charles Knowles, carrying on business at London Wharf, West Ferry-road, Millwall, was summoned before Mr. Mead at the instance of the London County Council, for erecting certain temporary wooden structures without having obtained a licence from the County Council to do so. Mr. Chilvers appeared to prosecute on behalf of the County Council, and Mr. Percy Gye, barrister, instructed by Mr. W. D. Styer, defended.

Mr. John Clarkson, District Surveyor for Poplar, said that on July 29 last he called the attention of the Council to the erection of certain structures on defendant's premises. They consisted of pieces of timber 7 in. by 2½ in. let into the ground. They were 13 ft. in height, and cross pieces 4 in. by 2 in. each were nailed to them. There were three rows, and there were gangways between them. The space covered by the structures was about 60 ft. by 50 ft. They were used for drying old sacks. They were close to St. Luke's Schools and Messrs. Bullivant & Co.'s works. In witness's opinion the structures were of a temporary character. There were no foundations to witness's knowledge.

Cross-examined by Mr. Gye, witness said he could not say if the posts went into the ground a distance of 3 ft. If they did, witness would not say that made them permanent structures. When posts were let into the ground it rotted them. If the posts were properly treated they would probably last for years. Witness could not say if they had been creosoted. As a matter of fact, he knew nothing of the posts below the ground.

By the Magistrate: If the structure would last twenty, thirty, or fifty years, witness was of opinion that it was temporary. He considered permanency began at a hundred years. If properly creosoted, the structures would last about twenty-

five years, but if they were not they would only last three or four years.

Mr. A. Dovaston, surveyor in the office of the London County Council, said he had surveyed the structures, and was of opinion they were of a temporary character. In case of fire there would be danger to Messrs. Bullivant's premises and to St. Luke's Schools. He saw no evidence of the posts having been creosoted. No consent had been given by the London County Council for their erection.

In cross-examination, the witness said in his opinion all wooden structures were temporary.

By the Magistrate: He would not say that old Putney Bridge, which was of wood, was temporary.

For the defence, Mr. Gye submitted that the prosecution had no case, and that these structures did not come within the meaning of the Act. They were not of a temporary or movable character, but were intended to last as long as the business was carried on. The business could not be carried on without them, as they were used for drying sacks, and they really formed part of the plant.

Mr. T. W. Price, F.S.I., the managing clerk to Mr. Bradshaw Brown, of 59, Fenchurch-street, E.C., was called for the defence and supported the statement of the counsel that the structures were permanent. The posts were properly creosoted. He considered that the structures in question having been erected for the purpose of carrying on a particular business should certainly be looked upon as plant, and could not come under the clauses of the Building Acts.

In cross-examination as to whether he would consider advertisement hoardings permanent structures witness gave it as his opinion that they were temporary structures as they were invariably erected for a short period only.

Having heard other evidence for the defence,

Mr. Mead said he had come to the conclusion that these summonses must be dismissed. He was of opinion that the structures were of a permanent character and not temporary. He considered that if they would last twenty-five years that was long enough to make them permanent. He also considered that all precautions were taken, and in the ordinary course of things the structures were likely to last for a term of twenty-five years. Another thing to be taken into consideration was the purpose for which they were erected, and he (the magistrate) considered the purpose in this case made them permanent. The summonses would, therefore, be dismissed, and he would grant the defendant three guineas costs.

In reply to Mr. Cuilvers, the magistrate refused to grant a case.

MEETINGS.

MONDAY, JANUARY 5.

Surveyors' Institution.—Mr. L. P. Hodge on "The Rights and Liabilities of Adjoining Owners with Regard to Highways." 8 p.m.

Clerks of Works' Association (*Carpenters' Hall*).—Monthly meeting. 8 p.m.

TUESDAY, JANUARY 6.

Manchester Architectural Association.—Mr. S. S. Platt on "Paving Stones." 7.30 p.m.

Glasgow Architectural Association. — Mr. Robert Miller on "Statics." 8 p.m.

WEDNESDAY, JANUARY 7.

British Archæological Association.—(1) Mr. G. Payne, F.S.A., on "The Durden Collection;" (2) Mr. J. H. Macmichael, on "The Tradesmen's Signs of Old London." 8 p.m.

South Kensington Museum (*Lecture Theatre*).—Mr. Maurice Hewlett on the "Rise of the Renaissance in England." I. 3.45 p.m.

THURSDAY, JANUARY 8.

Society of Antiquaries.—8.30 p.m.

FRIDAY, JANUARY 9.

Architectural Association. — Mr. J. A. Powell on "Opaque Glass." 7.30 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

734.—SYPHON FLUSHING APPARATUS: *W. R. & J. J. Rawlings.*—According to this patent, one or more capillary or flattened tubes open at the upper end into the upper part of the syphon, preferably on the discharge side. The lower end of the tube or tubes terminates slightly above the inlet opening of the syphon, and is surrounded with a wire cage or similar device when there is a possibility of the tubes becoming choked or stopped from the presence of suspended or floating matter in the water.

746.—SASH-BARS AND GLAZING: *L. Fawthrop.*—This invention relates to the bars for supporting the sheets of glass and for holding them down; the object being to provide against any dripping from condensation on the under surface of the glass. This is effected by an improved form of sash-bar, which combines a rest or support for the sheets of glass, below which is a channel for receipt and conduct of the water of condensation.

3,942.—JOINING LEAD PIPES: *G. H. Smith and B. Cooper.*—The respective ends of the pipes are, according to this invention, formed with a thread in connection with a coupling formed in white metal, the interior of which is threaded; or in another way the threads on the pipe ends are formed by reducing the exterior diameter by compression, and afterwards placing it in a die formed with a thread, and expanding the pipe therein by internal pressure. The same form of screwed ends is not only applied to pipes in lengths but is used for angles and bends.

13,007.—METAL LATHING: *W. W. Bostwick.*—The laths are formed with corrugations and V shaped projections and the specification describes machinery specially adapted for making them in this form.

16,113.—CONVERTIBLE LADDERS, &c.: *C. Ward.*—These ladders, which may be used separately, can also be combined by bolts and stays to form a pair of steps when desired.

16,117.—DOOR AND WINDOW FASTENER: *F. Weiss.*—To prevent rattling and secure the door or window in an open position, a fastener is made so that the catch can be passed from both sides over the knob of a projector and the door or window firmly secured.

16,231.—BRICK KILNS: *P. Crean.*—According to this invention, two series of small openings or flues are provided in the kilns, and gratings are raised above the floor of the kiln so as to allow air to pass in to assist combustion. When burning the bricks, instead of the furnaces being constantly open and kept fed with fuel they are closed immediately after the kiln has been steamed, or about thirty-six hours after being lighted, and the necessary heat is maintained by introducing small quantities of slack or coal-dust through the flues. These flues or openings can also be used for cooling purposes when required.

NEW APPLICATIONS FOR PATENTS.

December 15.—20,409, W. McGie, Preventing Blowdowns in Chimneys.

December 16.—20,475, J. Leather, Ventilating Structures. — 20,477, P. Lawrence, Producing Ornamental Designs in Wood, &c.—20,492, C. Vollman, Pipe Connections.—20,503, J. Bautier, Window Sashes.—20,528, J. Fairfax, Portable Buildings.—20,534, N. Hodges, Protecting Buildings from Lightning.

December 17.—20,554, J. Boot and W. Clark, Fire Grates.—20,559, W. Scott Moncrieff, Water Waste Preventing Cisterns.—20,611, E. Lucas, Wall Decorations. —20,627, J. Bayly, Chimney Cap and Ventilator.—20,638, R. Stanley, Boring and Tunnelling Machines.

December 18.—20,649, B. Giraud, Gutter Bricks.—20,661, J. McGlashan, Ventilating and Chimney Cowls. —20,700, H. Lake, Flooring for Stables, &c.

December 19.—20,717, J. Chorlton & G. Scott, Step Ladders.—20,720, C. Darrah, Ventilating and Illuminating Closed Shop Windows and Shop Fronts.—20,730, J. McGlashan & E. Braidwood, Painters' Brushes, &c.—20,763, A. Attwood & R. Jackson, Revolving Wood Shutters, &c.

December 20.—20,789, J. Bayly, Flushing Apparatus.—20,799, J. Bayly, Brick Kiln. — 20,812, J. Sowden, Affixing Sash Lines to Window Frames, &c.—20,814, T. Clarke, Chimney Pots.—20,830, H. Bayley, Electric Ceiling Roses and Wall Connectors.—20,831, W. Oakley & C. Spurrier, Electric Ceiling Roses and Wall Connectors.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,956, D. Corley, Screw for Securing Roofs.—18,106, T. Harrison and W. Chaloner, Chimney-tops.—18,433, J. Raffety, System of Ventilation.—18,643, S. Bourne and G. Leonard, Fire-places or Stoves.—18,725, E. Ward, Flush Cisterns.—18,796, J. Benford, Locking Sash-fastener and Electrical Alarm and Indicator for Windows, &c.—18,818, A. Steele, Stoves or Fire-grates.—18,927, G. Webley, Escape from Burning Buildings.—18,930, R. Gregory and H. Harris, Ventilating Air-pipe and Cowl.—19,056, G. Kincaid and H. Goujon, Lining Brush Attachment.—19,599, F. Beech and H. Dixon, Automatically Supplying Fuel to the Fires of Kilns, &c. —19,712, J. Bayly, Roofing.—19,741, W. Press, Sash-Fasteners.—19,752, F. Hadfield, Screws for Wood, &c.—19,897, J. Libby, Chimney-top, Cowl, or Windguard, for Preventing Downdraught.—20,178, G. Farrow, Portable Stage, Scaffold, or Skeleton Tower, to be employed in repairing the interior of lofty buildings, and for other uses.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

20,711, S. Danischewsky, Door Fastener.—985, H. Grimshaw, White Pigment.—2,542, F. Bird, Sewer Ventilation Columns or Shafts.—2,739, E. Ingham, Draught Preventers.—2,787, E. Seddon, Apparatus for Sand-Papering Wood.—3,075, G. Light, Intercepting Taps for Drains, &c.—3,431, J. Naylor and H. Williams, Moulding and Pressing Semi-Dry Bricks.—6,918, G. Deacon, Strips or Bars for Glazing Applicable to Rafters, &c.—18,553, G. Meyer, Door-Springs.—18,609, J. Bond, Drying Bricks, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	15	0	7	5	0
Teak, E.I. ....load	10	0	0	13	0	0
Sequoia, U.S. ....foot cube	0	2	8	0	3	0
Ash, Canada....load	2	10	0	4	5	0
Birch "	2	5	0	4	5	0
Elm "	3	10	0	4	15	0
Fir, Dantsic, &c....	2	0	0	3	15	0
Oak "	2	10	0	4	10	0
Canada	4	17	6	6	10	0
Pine, Canada red	2	10	0	3	10	0
" yellow	2	0	0	5	10	0
Lath, Dantsic....fathom	5	0	0	6	0	0
St. Petersburg	5	0	0	7	0	0
Deals, Finland, 2nd & 1st. std. 100	7	10	0	10	0	0
" " 4th and 3rd	7	0	0	7	5	0
Riga	6	0	0	8	0	0
St. Petersburg, 1st yellow	9	10	0	14	10	0
" 2nd "	7	10	0	9	0	0
" white	7	0	0	10	0	0
Swedish	7	0	0	15	10	0
White Sea	8	0	0	17	0	0
Canada, Pine, 1st	13	0	0	24	0	0
" " 2nd	9	0	0	16	0	0
" " 3rd, &c.	7	0	0	10	0	0
" Spruce, 1st	8	10	0	10	10	0
" " 3rd and 2nd ..	6	10	0	8	0	0
New Brunswick, &c.	5	10	0	7	10	0
Battens, all kinds	4	10	0	15	10	0
Flooring Boards, sq., 1 in., prepared, First	0	10	0	0	14	0
Second	0	8	0	0	10	6
Other qualities	0	5	6	0	7	9
Cedar, Cuba ....foot	0	0	4	0	0	5
Honduras, &c.	0	0	3½	0	0	4½
Mahogany, Cuba....	0	0	4½	0	0	6½
St. Domingo, cargo average ..	0	0	4½	0	0	6½
Mexican "	0	0	4½	0	0	5½
Tobasco "	0	0	5½	0	0	6½
Honduras "	0	0	5½	0	0	6½
TIMBER *(continued)*.	£.	s.	d.	£.	s.	d.
Box, Turkey ....ton	4	0	0	13	0	0
Rose, Rio	12	0	0	19	0	0
Bahia	10	0	0	18	0	0
Satin, St. Domingo....foot	0	0	9	0	1	3
Porto Rico	0	0	10	0	1	6
Walnut, Italian	0	0	4	0	0	7
METALS.						
IRON—Bar, Welsh, in London tn	6	10	0	6	17	6
" " at works in Wales	6	0	0	6	10	0
" Staffordshire, in London..	7	0	0	8	0	0
COPPER—British, cake and ingot	57	10	0	58	10	0
Best selected	59	0	0	60	0	0
Sheets, strong	53	0	0	0	0	0
Chili, bars	53	0	0	0	0	0
YELLOW METAL....lb.	0	0	6¾	0	0	6¾
LEAD—Pig, Spanish ....ton	13	2	6	13	5	0
English, com. brands	13	5	0	13	7	6
Sheet, English, 3 lbs. per square foot and upwards....	15	0	0	15	10	0
Pipe	16	10	0	0	0	0
ZINC—English sheet ....ton	27	5	0	27	10	0
TIN—Straits	90	15	0	0	0	0
Australian....	90	15	0	0	0	0
English Ingots....	0	0	0	0	0	0
OILS.						
Linseed ....ton	21	10	0	22	0	0
Cocoanut, Cochin	33	10	0	34	0	0
" Ceylon	29	0	0	0	0	0
Palm, Lagos	26	0	0	26	10	0
Rapeseed, English pale	28	5	0	0	0	0
" brown	26	15	0	0	0	0
Cottonseed, refined	18	5	0	0	0	0
Tallow and Oleine	21	0	0	40	0	0
Lubricating, U.S.	6	0	0	7	0	0
" refined	7	10	0	12	0	0
TAR—Stockholm....barrel	1	1	0	0	0	0
Archangel....	0	14	0	0	0	0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ABERAVON.—For re-building "Globe" Hotel, at Aberavon, for Mrs. Hannah Davies. Mr. George F. Lambert, architect, Bridgend:—

John Davies	£2,840	Morgan Cox, Aberavon*	£2,430
J. & S. Rees	2,750	Charles James	2,150

* Accepted.

BRIGHTON.—For erecting house and stabling in Florence-road, for Mr. W. Fowler. Messrs. Puttick & Puttick, architects, 82, Queen's-road, Brighton:—

Hackman & Son	£1,283 10 0	Holloway Bros.	£1,141 0 0
Cox & Sons	1,235 0 0	W. & A. Elliott	1,078 14 6
Freeman	1,235 0 0	Wright*	1,025 0 0
Saunders	1,213 0 0		

* Accepted.

COLCHESTER.—For building boot department for the Co-operative Society. Mr. Geo. Lee, architect:—

G. Bloice	£419 0	G. Dobson	£270
R. Beaumont	347 10	Appleton, Smith, & Co., Colchester*	267 10
T. J. Ward	338 0		
G. Farran	310 0		
F. Dupont	295 0		

* Accepted.

COLCHESTER.—For the erection of a pair of semi-detached villa residences in Beaconsfield-avenue, for Mr. H. E. Shaw. Mr. Chas. E. Butcher, architect, Victoria Chambers, Colchester. Quantities supplied:—

G. Dobson	£960	R. Beaumont	£875
T. J. Ward	909	F. Dupont, Colchester*	855
C. E. Orfuer	898		

* Accepted.

COLWALL (Hereford).—For the erection of factory and outbuildings at Colwall, for Messrs. J. Schweppe & Co., Ltd. Messrs. Truefitt & Truefitt, architects, 5, Bloomsbury-square, London. Quantities by Messrs. Morris, Evans, & Son, 7, John-street, Adelphi:—

Kendrick	£4,452	Everal	£3,759
Broad	4,271	J. Wood & Sons, Worcester*	3,723
Estcourt & Son	3,947		
Collins	3,769		

* Accepted.

EARLSTON (N.B.).—For the execution of certain works at the parish church of Earlston, Berwickshire, for the Heritors of the parish. Messrs. Hardy & Wight, architects, 74, George-street, Edinburgh:—

A. T. Ingles & Son	£2,840 0 0
W. Rodger & Son, Earlston (accepted)	2,349 7 0

FROME.—For re-seating, new flooring, and other work at Holy Trinity Church, Frome, Somerset. Mr. W. G. Brown, architect:—

A. Clarke	£668	F. Seward	£440
T. Parfitt	502	Chislett & Son, Frome*	429
Jos. Bird	456		

* Accepted.

GUILDFORD.—For improvements to premises for Mr. J. Lymposs, Spital-street, Guildford:—

D. Coker	£290 0	R. Wood	£247
G. Garnett	268 10	R Smith (accepted)	218
S. Ellis	265 0		

HASLEMERE.—For erecting one pair of semi-detached houses for Mr. W. Heather, sen., Haslemere:—

G. Moory	£820 11	J. Marshall	£687
R. Pink	744 0	F Milton, Witley*	630

* Accepted, including pump, well, and steps.

HORNSEY.—For paving, kerbing, channelling, and making-up section No. 1 Farefain-road, for the Hornsey Local Board. Mr. T. De Courcey Meade, Engineer

Lewis Griffiths, Millwall, E. (accepted) £1,502 13 0

LEEDS.—Accepted for the erection of semi-detached villas, Roundhay, Leeds, for Mr. E Holt. Messrs. John Hall & Son, architects, 72, Albion-street, Leeds. Quantities by architects:—

Thos. Kitchen, *Bricklayer and Mason*	£440 0 0
John Benton, *Joiner and Carpenter*	249 0 0
A. Stephens, *Plumber and Glazier*	74 0 0
W. Evans, *Plasterer*	67 13 0
W. Walsh & Sons, *Painters*	21 10 0
J. Leason, *Slater*	30 12 0

[All of Leeds.]

LONDON.—For laying-out a recreation ground at Tench-street, Wapping, E., for the London County Council:—

Feast	£1,735	Kavanagh	£1,520
Measton	1,695	Willson, 277, Cable-street	1,315
J. Biggs	1,590		

LONDON.—For alterations and additions to 14, Cockspur-street Pall Mall. Messrs. Glasier & Sons, surveyors:—

Clarke & Mannooch	£1,497 0	F. G. Davis, Theobald's-road*	£1,347 10
J. F. Ford	1,447 0		
Holloway Bros.	1,312 0		

* Accepted.

LONDON.—For taking down and re-building Nos. 1 and 2, Harris-terrace, St. George's-in-the-East, for the Governors of Raine's Charities. Mr. A. Ashbridge, architect, 65, Leadenhall-street, E.C. :—

Cleaver	£450 0 0	Dawson	£347 10 0
Hearle	395 0 0	Willson, 277, Cable-st.*	315 0 0

* Accepted.

LONDON.—For repairs, &c., at 12, Wilson-street, Finsbury, E.C. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C. :—

Wm. Pett	£130 0 0	Bargman & Son	£89 12 0
Harrison & Spooner (accepted)	£87 0 0		

MORPETH.—For alterations and additions to the "Newcastle House" Hotel, Morpeth, Northumberland, for Messrs. Jno. Sanderson & Sons. Messrs. Stockwell & Spicer, architects, 11, Pilgrim-street, Newcastle-on-Tyne. Quantities by the architects :—

H. Brown & Co.	£888 7 0	Jos. Simmons & Sons, Dudley, Northumberland*	649 15 0
Matt Routledge	769 3 0		
T. W. Middlemiss	753 16 1		
Bryson, jun.	686 1 1½	Sidney Millard	628 7 0
W. & W. Scott	661 14 9½		

*Accepted.

MORTLAKE.—For the supply and erection of sewage sludge pressing plant and machinery at the precipitation works, Mortlake, for the Richmond Main Sewerage Board. Mr. J. C. Melliss, engineer, 232, Gresham-house, Old Broad-street, E.C. :—

Weyman & Co.	£1,891 0	Manlove, Alliott, & Co.	£1,786 0
S. H. Johnson & Co., Stratford, E.*	1,825 0	Goddard, Massey, & Warner	1,749 15

* Accepted.

PAIGNTON.—For erection of Masonic Hall, Paignton. Mr. George Sowdon Bridgman, architect. Quantities supplied by architect :—

C. & R. E. Drew	£735	C. W. Perrett	£695
R. Harris	698	Rabbich & Brown (accepted)	663

PENZANCE.—For building dwelling-house, out-offices, and premises on the Lescudjack Estate, for Mr. R. G. Allen. Mr. J. Wm. Trounson, architect, 27, Clarence-street, Penzance :—

Wm. Pascoe	£1,715	Walters, Burnett, & Walters	£1,604
A. Carkeek	1,674		
W. H. Stephens	1,612	Thomas & Bottrell	1,600
Wm. Ford, Penzance (accepted)	£1,597 0 0		

SALTASH.—For taking down old and erecting new dwelling-house at Boisdale, North-road, Saltash :—

Alfden, Saltash £670 0 0

SEVENOAKS.—For alterations and additions to Warren Cottage, near Sevenoaks, Kent. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C. :—

Allcorn & Sons £319 0 0
Iggulden, Wrotham (accepted) 296 0 0

STONE (Staffordshire).—For laying water-pipes at the Union Workhouse, for the Union Guardians. Mr. J. J. Chapman, engineer, Walton, Stone :—

H. McWhinnie	£200 3 4	Wm. Smallwood, Stone*	£180
Swift & Barlow	180 0 0		

* Accepted.

TUNBRIDGE.—For the erection of a farm-house near Tunbridge Kent. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C. :—

Iggulden ..... £488 | Allcorn & Son, Shipbourne* £425

* Accepted.

WREXHAM.—For new offices for the Wrexham Water Works Company. Mr. Alfred C. Baugh, architect, Egerton-street, Wrexham :—

		Amended.
Parker Bros.	£2,997	£2,591
Hughes & Owen	2,670	2,340
Benj. Owen	2,692	2,312
J. Woolley	2,831	2,297
Brown & Backhouse	2,728	2,285
J. Gethin	2,669	2,202
Davies Bros.	2,546	2,140
W. E. Samuels, Wrexham (accepted)	2,429	2,025

WREXHAM.—For an arcade, for the Wrexham Arcade Company, Limited. Mr. Alfred C. Baugh, architect, Egerton-street, Wrexham :—

W. E. Samuel	£6,100	Hughes & Owen	£5,886
Benjamin Owen	6,080	Brown & Backhouse	5,770
Davies Bros.	5,911	J. Gethin	5,715

WREXHAM. — For rebuilding Busham Hall, for Mr. J. F. Edisbury. Mr. Alfred C. Baugh, architect, Egerton-street, Wrexham :—

Morrison & Sons	£2,354	Davies Bros.	£2,095
Brown & Backhouse	2,167	Thos. Holmes	2,084
Jno. Gethin	2,134	Hughes & Owen	2,000
Benj. Owen	2,115	W. E. Samuel, Wrexham*	1,890

* Accepted.

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We are compelled to decline pointing out books and giving addresses.

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We cannot undertake to return rejected communications.

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The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent

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Now ready.
READING CASES, { NINEPENCE EACH. By post (carefully packed), 1s.

W. H. Lascelles & Co.
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THE BATH STONE FIRMS, Limited.
HEAD OFFICES: BATH.

DOULTING FREESTONE.
THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.
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London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.

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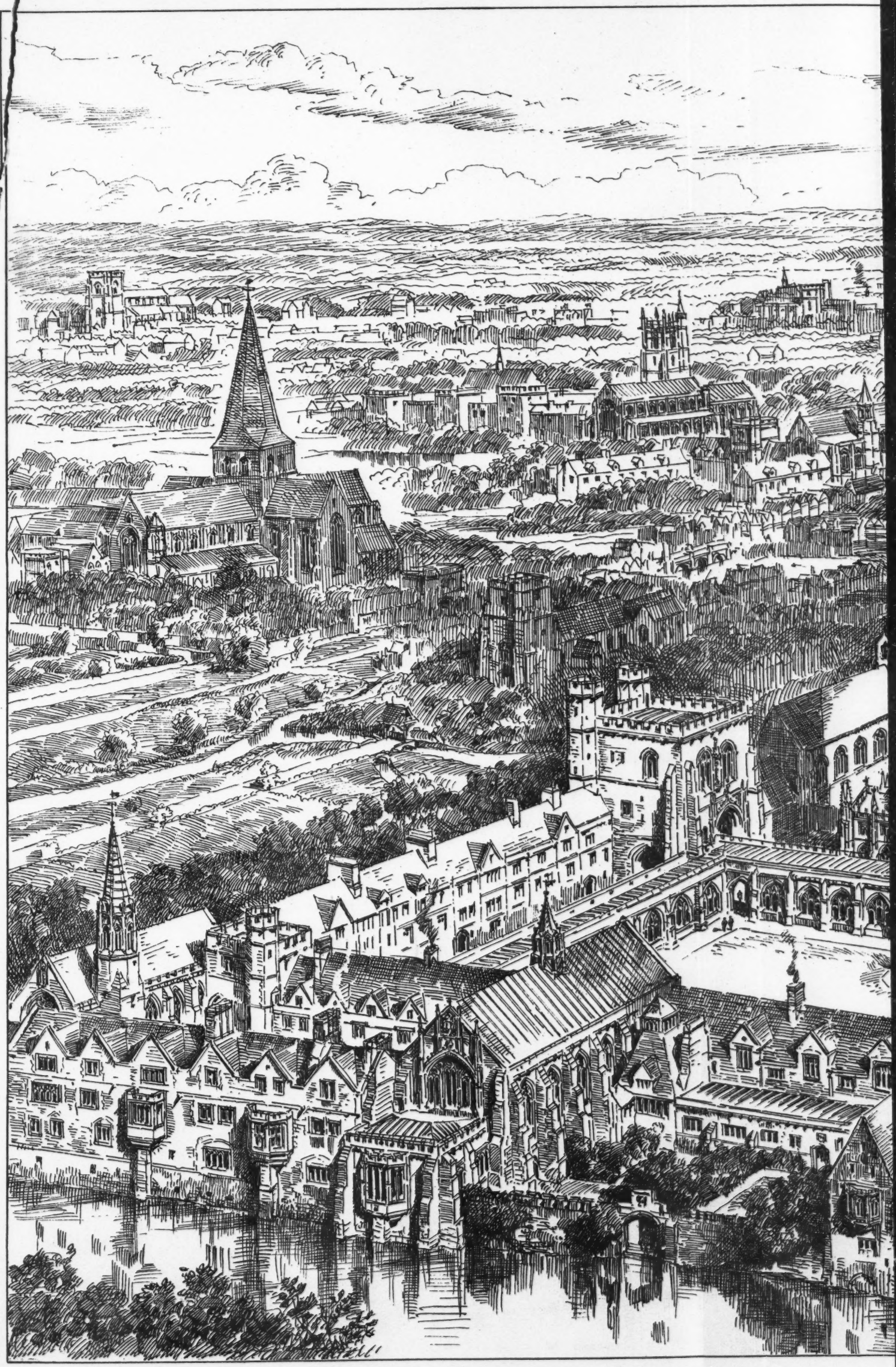
Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

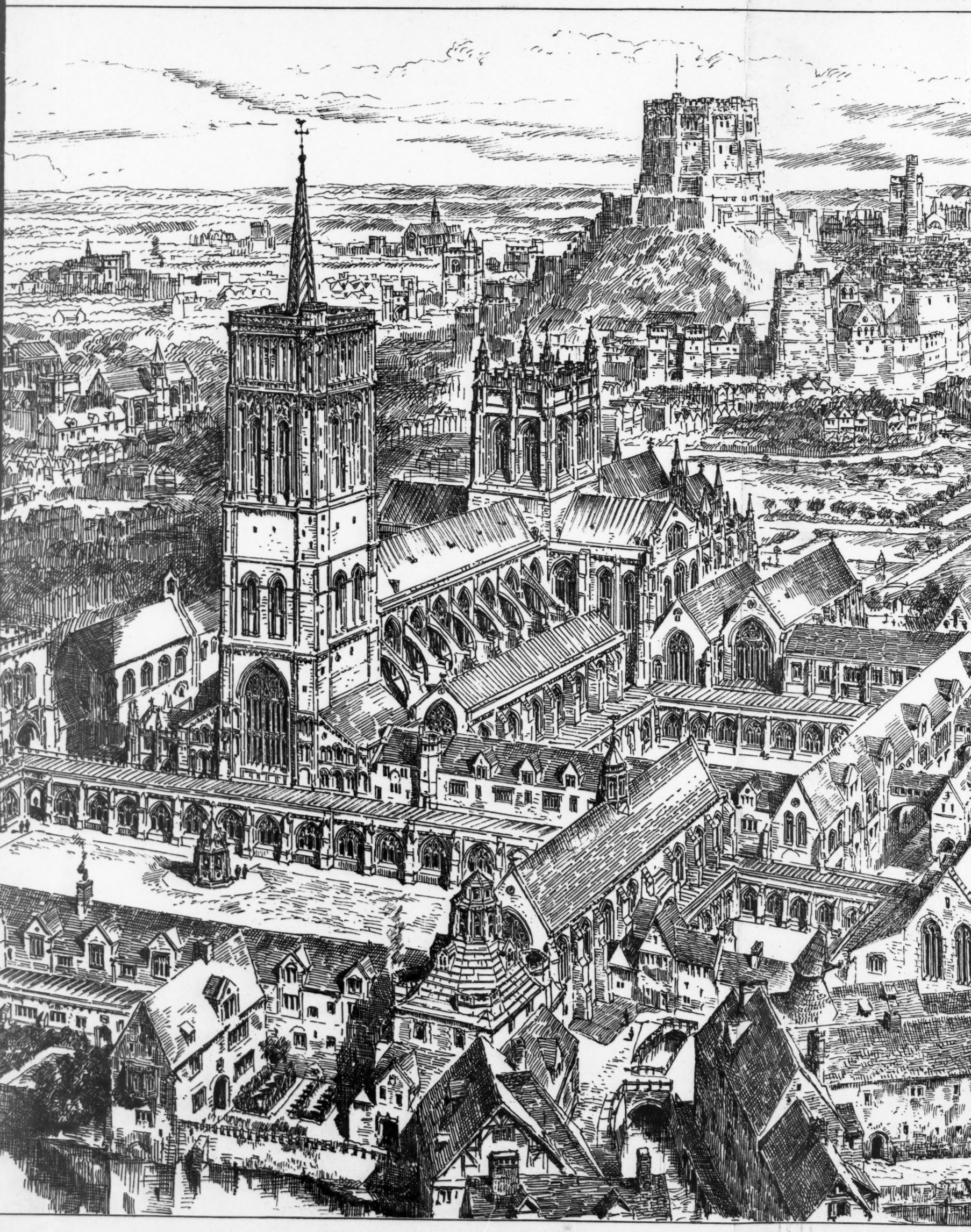
SPRAGUE & CO.'S
INK-PHOTO PROCESS,
22, Martin's-lane,
Cannon-street, E.C. [ADVT.

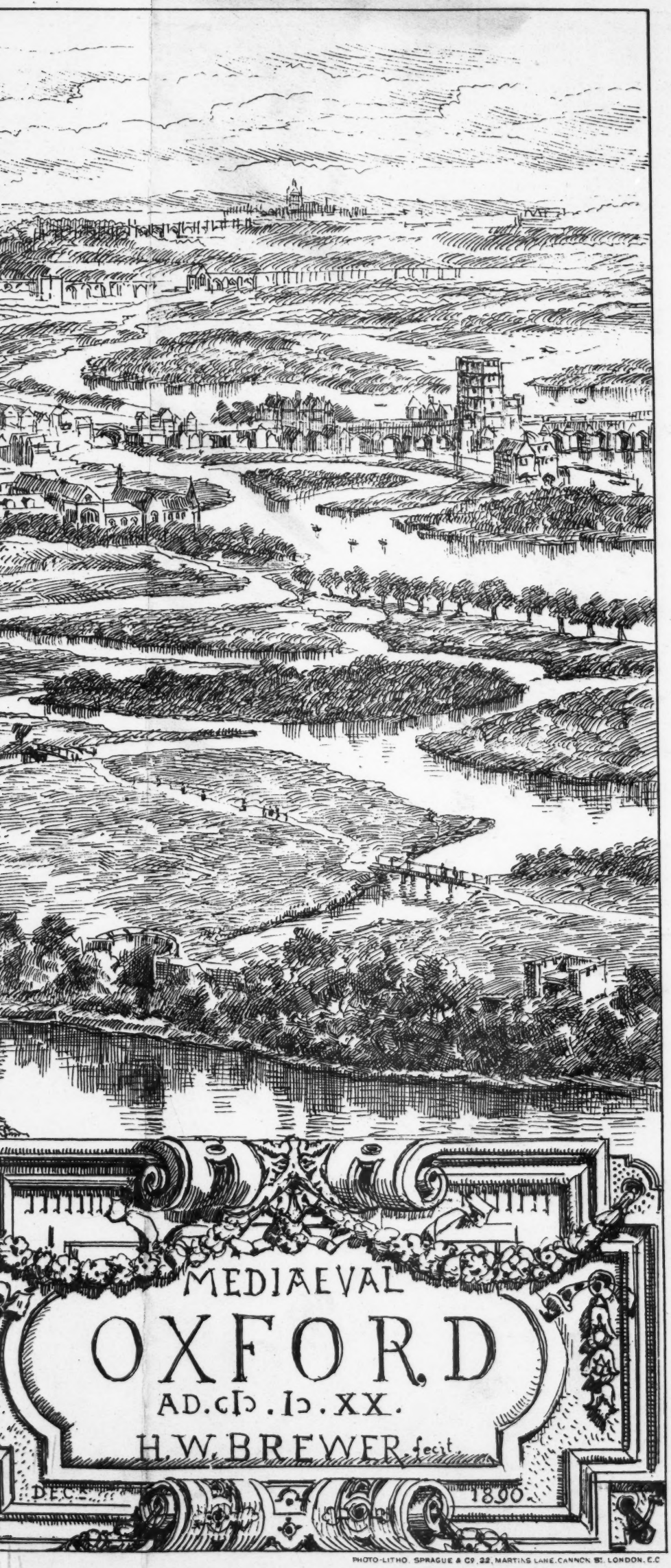
DRY MAHOGANY,
WAINSCOT, WALNUT, TEAK, &c.
EXTENSIVE AND VARIED STOCK
WILLIAM BLOORE,
80 to 90, BOND STREET, VAUXHALL, and 57 to 67, SOUTH LAMBETH ROAD, S.W.

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT.
COLLINGE'S PATENT HINGES, LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS, and IMPROVED GATE FITTINGS of every description.
36A, BOROUGH ROAD, LONDON, S.E.
PRICES REDUCED. LIST SENT ON APPLICATION.

TWELVE GOLD AND SILVER MEDALS AWARDED.
IRON CISTERNS.
F. BRABY & CO.
VERY PROMPT SUPPLY.
LARGE STOCK READY.
Particulars on application.
CYLINDERS FOR HOT-WATER CIRCULATION.
LONDON: 352 to 362, Euston-road.
LIVERPOOL: 6 and 8, Hatton Garden.
GLASGOW: Peteshill-road.







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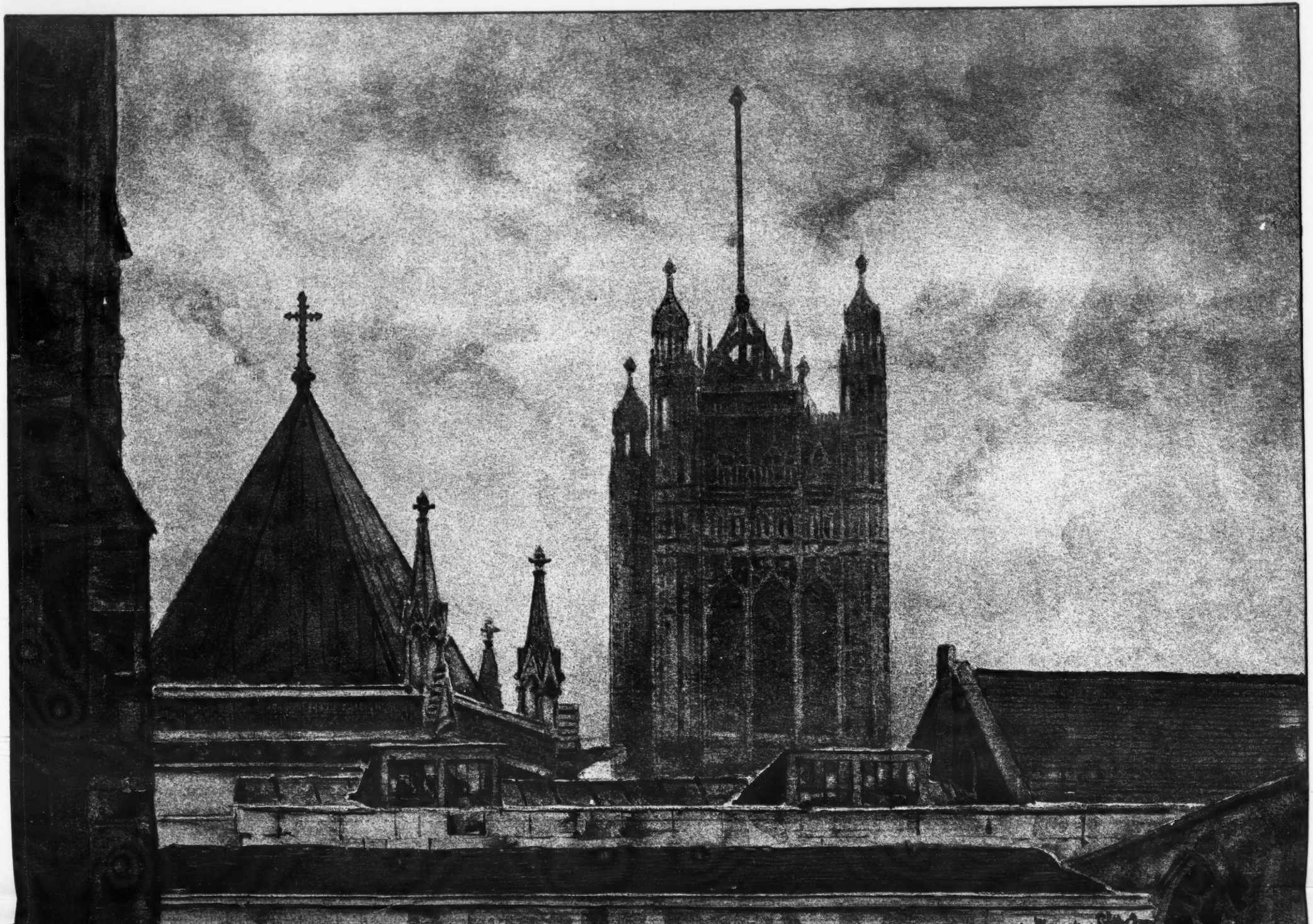

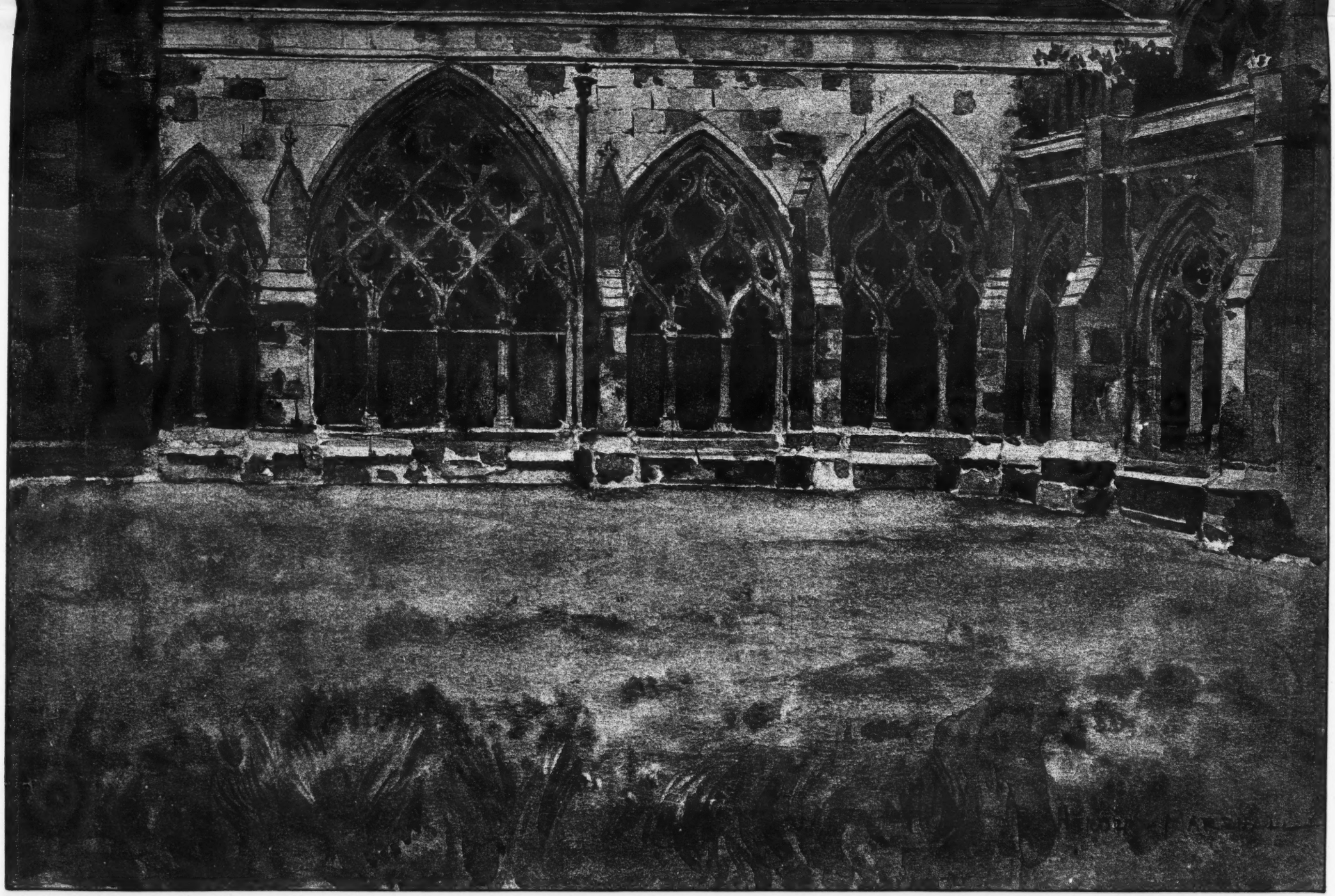

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VIEW IN THE CLOISTERS, WESTMINSTER ABBEY.—Drawn by Mr. Herbert Marshall.

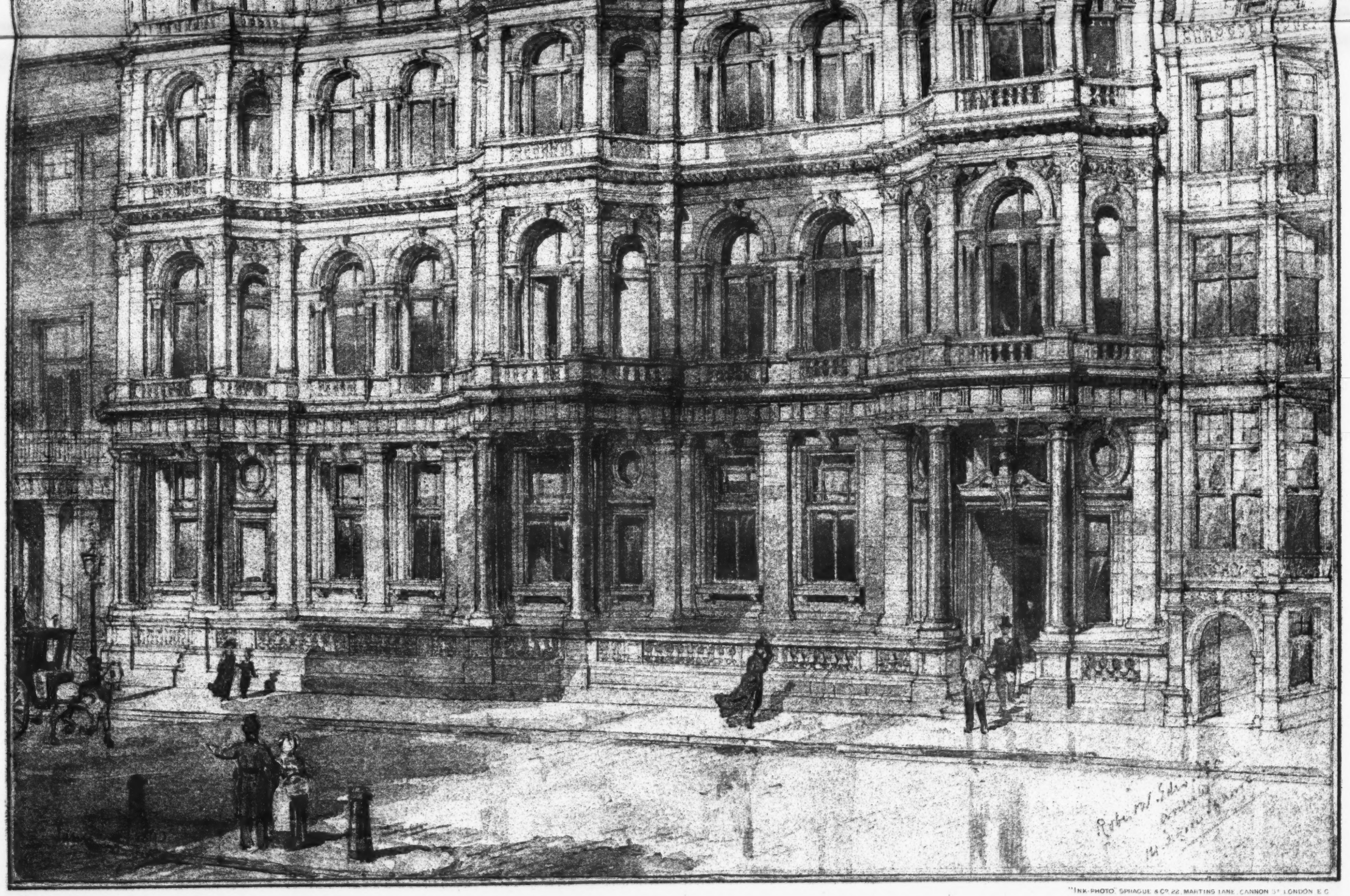
MR. D'OYLY CARTE'S NEW THEATRE, SHAFTESBURY AVENUE.—Mr.

PHOTO-LITHO SPRAGUE & CO 22 MARTINS LANE CANNON ST LONDON E C

UE.—Mr. T. E. Colcutt, F.R.I.B.A., Architect for the Exterior Design.

"INK-PHOTO," SPRAGUE & Co. 22, MARTINS LANE, CANNON ST., LONDON, E.C.

NEW LAW COURTS, BIRMINGHAM: THE GREAT HALL.—Mr. Aston Webb, F.R.I.B.A., and Mr. E. Ingress Bell, F.R.I.B.A., Architects.



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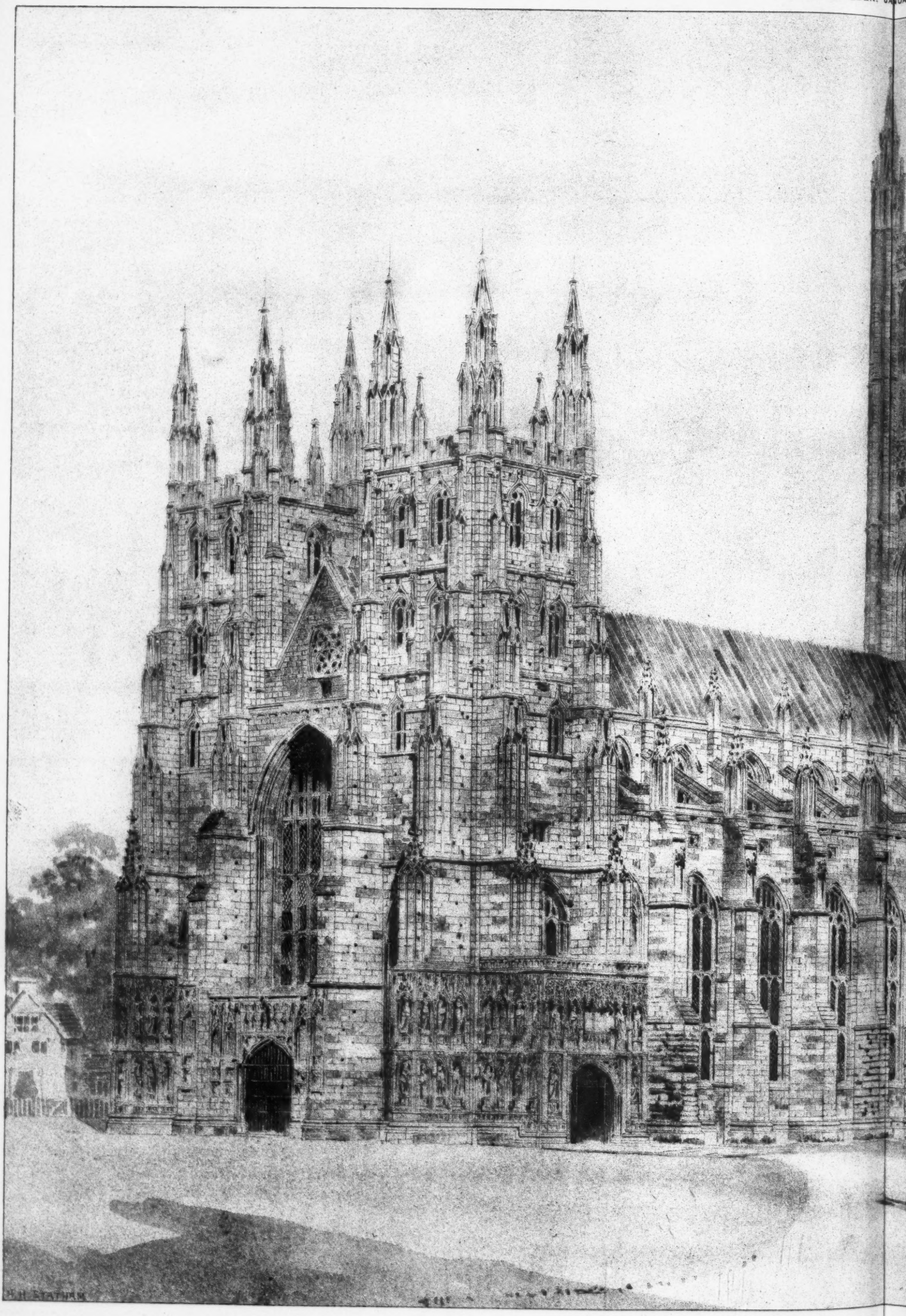
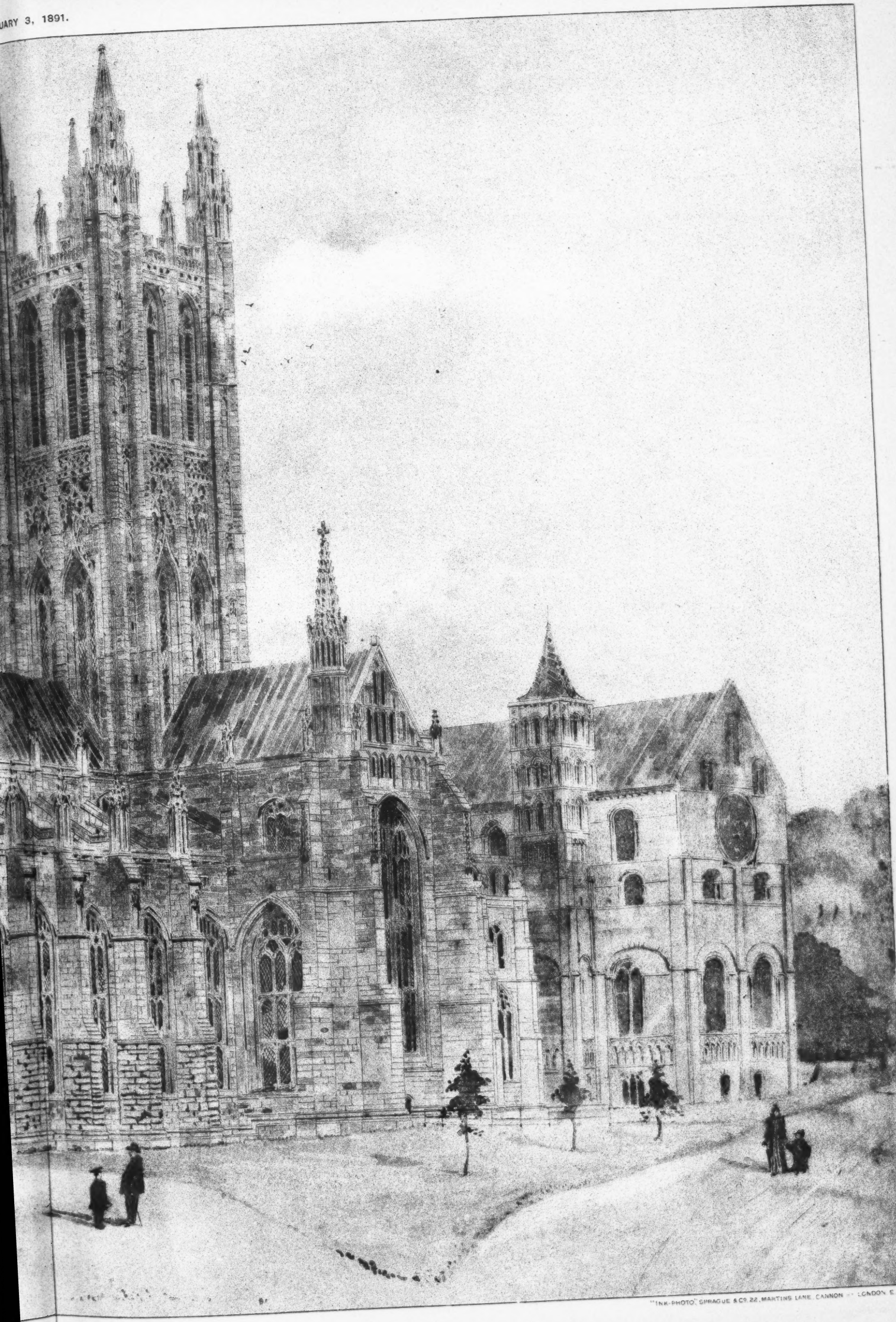
THE JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.—Mr. R. W. Edis, F.R.I.B.A., Architect.



Cathedrals of Englan

No. 1. CANTERBURY.—Dra



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England and Wales.

BURY.—Drawn by the Editor.

PLAN OF CANTERBURY CAT

EXPLANATIONS.

A *Baptistery*
B *Sub-vaults*
C *Treasury*
D *St. Andrew's Chapel*
E *Henry IV Chantry*
F *Corona or Becket's Crown*
G *St. Anselm's Chapel*
H *St. Michael's Dº*
I *The Lady or Deans' Dº*
J *South Porch*
K *Stairs to Parrise*
L *Western Entrance*

Lanfranc
Norman { not known to be Lanfranc }
Romanesque
William of Sens
English William
13th century
14th dº
15th dº
Post-Reformation
Uncertain
Present century

CLOISTERS.

LIBRARY.

CHAPTER HOUSE

MARTYRDOM

NORTH AISLE or NAVE

NAVE

SOUTH AISLE or NAVE

NORTH AISLE or CHOIR.

CHOIR.

SOUTH AISLE or CHOIR.

S.W TRANSEPT

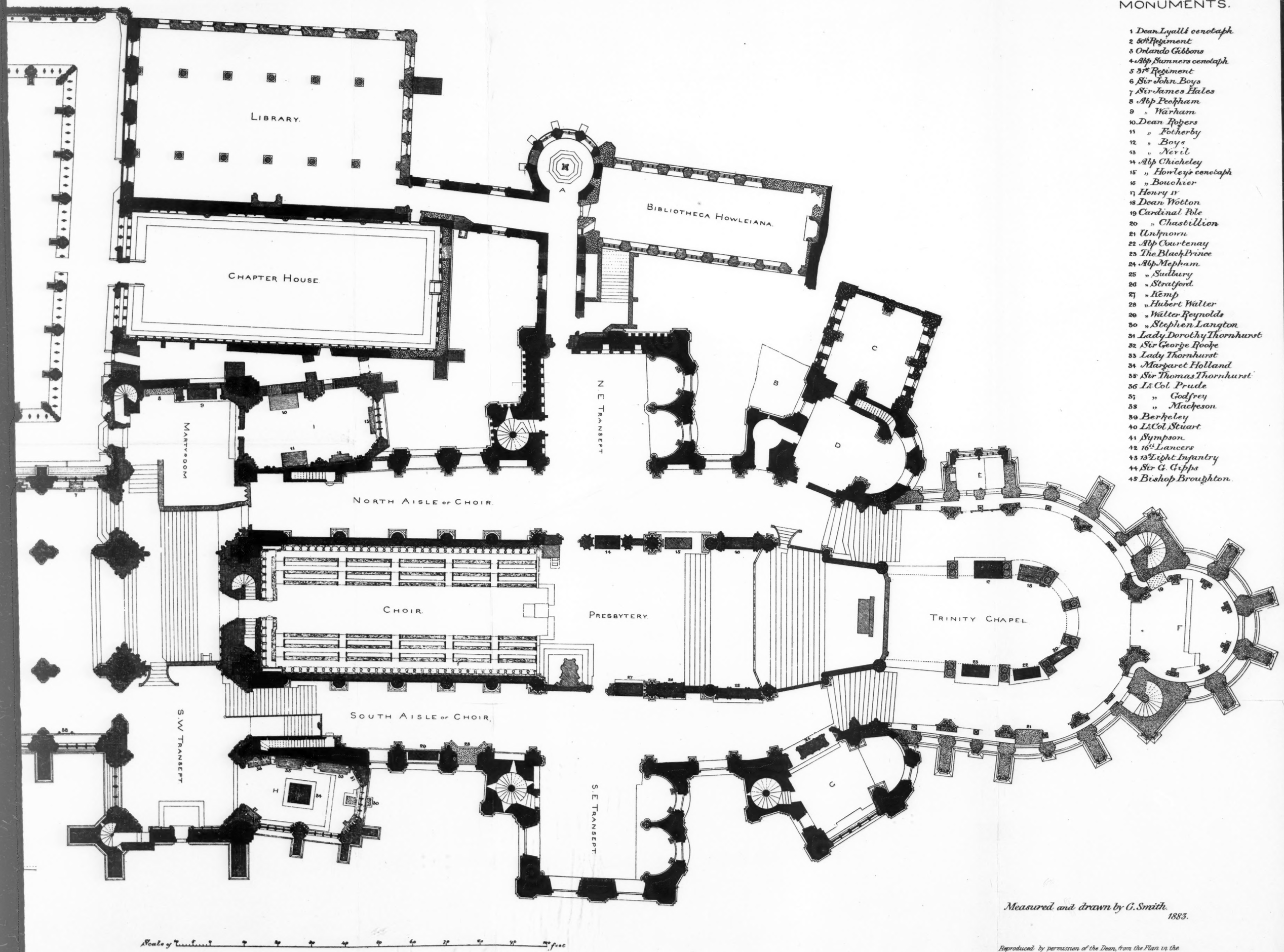
Nave *Choir* *Retro-choir*

Angles of Orientation.

Scale of Feet

PHOTO-LITHO SPRAGUE & Co. 22 MARTINS LANE, CANNON ST. LONDON E.C.

PLAN OF CANTERBURY CATHEDRAL.



MONUMENTS.

1 Dean Lyall's cenotaph
2 50th Regiment
3 Orlando Gibbons
4 Abp Sumners cenotaph
5 31st Regiment
6 Sir John Boys
7 Sir James Hales
8 Abp Peckham
9 „ Warham
10 Dean Rogers
11 „ Fotherby
12 „ Boys
13 „ Nevil
14 Abp Chicheley
15 „ Howley's cenotaph
16 „ Bouchier
17 Henry IV
18 Dean Wotton
19 Cardinal Pole
20 „ Chastillion
21 Unknown
22 Abp Courtenay
23 The Black Prince
24 Abp Mepham
25 „ Sudbury
26 „ Stratford
27 „ Kemp
28 „ Hubert Walter
29 „ Walter Reynolds
30 „ Stephen Langton
31 Lady Dorothy Thornhurst
32 Sir George Rooke
33 Lady Thornhurst
34 Margaret Holland
35 Sir Thomas Thornhurst
36 Lt Col Prude
37 „ Godfrey
38 „ Mackeson
39 Berkeley
40 Lt Col Stuart
41 Sympson
42 16th Lancers
43 13th Light Infantry
44 Sir G. Gipps
45 Bishop Broughton.

Measured and drawn by G. Smith. 1883.

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